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A real national body

The two thirds of higher education encompassed in the universities and the one third made up of the polytechnics and colleges are rather like two super tankers manoeuvring independently in a fog. They follow separate courses, sometimes diverging sometimes converging. The primitive radar provided by the Department of Education and Science in the form of its policy for all higher education is quite inadequate to prevent disturbing deviations from a common course and grinding collisions between the two sectors.

Two years ago the DES did not dissent from the judgment of the University Grants Committee that the universities should put quality before quantity and so that because public expenditure on universities was being cut the number of university students should also be reduced. The inevitable consequence was that would-be university students were displaced into the polytechnic and college sector and there was a sudden acceleration in student growth there. The inevitable consequence of this was that alarm bells about quality, as measured by a plunging unit of resource (expenditure per student), began to ring in the polytechnics and colleges. The new National Advisory Body then imposed a ceiling of 256,000 full-time equivalent students.

Faced with an alarming restriction of higher education opportunity for 18-year-olds - and in an election year too - the DES had second thoughts about its (thoughtless) endorsement of the UGC's "quality first" policy of 1981. It began to put heavy pressure on the UGC, indirectly through embarrassing inter-sectoral comparisons of student costs and directly through plain-worded letters of guidance from Sir Keith Joseph, to change this policy. Two weeks ago the UGC grudgingly bowed to this pressure and sent out a new letter to universities encouraging them to admit more students next year and the year after without, of course, receiving any more money to pay for them. So the rather unappealing circle of expediency and muddle is complete. Perhaps the UGC got it wrong - first time round - and the DES got it right -

second time round. But that is hardly the point. What is important is that the DES as the nearest thing higher education has to an intelligent brain was sending out and receiving back quite contradictory messages to and from the limbs of the system about its intended behaviour. This particular episode could be more easily forgotten or forgiven if there were any grounds for supposing that it was exceptional. But there are not. All the evidence suggests that such disorganization is endemic.

Some will blame this disorganization on deficient political leadership, either by suggesting that no politicians have thought seriously about the broad direction they wish higher education to follow or by criticizing Sir Keith more directly for his fantastic and irrelevant obsessions about "islanding" some universities and floating them off into the never-never land of pure private enterprise. But the trouble probably goes much deeper than the inattention or distraction of politicians. The disorganization of higher education policy is an institutional more than a political failure.

Over the next ten years and especially in the last five the policy organs of higher education, the DES itself, the UGC, the NAB and the Advisory Board for the Research Councils, have all developed a reasonable capacity to take sensible managerial decisions. The DES, largely through the NAB, has acquired valuable hands-on experience of the polytechnics and colleges (and is looking forward with eagerness to acquiring similar experience through a more open UGC). The UGC has always had and the NAB is rapidly acquiring a sophisticated information bank. The ABRC has begun to range more widely over higher education policy rather than simply acting as a holding company for the five research councils.

Yet their capacity to take strategic decisions; certainly strategic decisions that are consistent with those taken by the others, remains as primitive as ever. One answer of course is to build a stronger web of trans-binary coordination, by creating more working parties and groups that look at problems that

affect all higher education and nudging the UGC and the NAB into ever closer cooperation. But this can only help to coordinate managerial decisions taken from both sides of the binary line or in the research community; it cannot fill the strategic vacuum.

Another answer may be to follow the recommendation in the final Leverhulme report to establish a centre for higher education policy studies, with some training for top institutional managers thrown in. Valuable as such a centre would be, it cannot fill the strategic vacuum either. Just as the managerial activity of trans-binary coordination is inevitably post-strategic, in the sense that it is ill-equipped to ask basic questions and must accept the prevailing context of policy, so the more academic activity of a centre for higher education policy would be pre-strategic, in the sense that it would provide the empirical and intellectual building blocks that could be used to construct strategic policies.

The only satisfactory method to fill this strategic vacuum is to create a national higher education commission as they have in Australia, Sweden, most of the individual states of the United States and innumerable other countries. Not another quango, will be the cry of horror in most quarters. But there is no need for such a commission to spawn an elaborate bureaucracy. Its purpose should be strictly strategic not executive; it should not get involved in the detailed business of allocation.

Such a commission is perhaps best thought of as a higher education think tank with political clout and constitutional prestige. It could help to avoid the kind of muddle we have observed over the proper balance between unit costs and student numbers on both sides of the binary divide. It could inform and discipline the very important debates that must take place about the stratification of the universities, the earmarking of research, the reform of degrees and the development of continuing education. It could act as a catalyst for clear thinking about the future at a time when clear thinking, by government and by higher education, has never been more important.

Inspectors on trial

If at first you don't succeed... Having failed to persuade the Council for National Academic Awards to bring in a verdict of guilty against the Polytechnic of North London's sociology and applied social studies degrees, Sir Keith Joseph has had better luck with HM Inspectorate. Although the inspectors of the two degrees took place at short notice and at an awkward time on either side of the Spring Bank Holiday when, to quote the inspectors' own words, "teaching programmes were virtually finished on some of the courses, and some students were either engaged on personal revision or were concentrating on completion of their written assignments" the report does not shrink from categorically worded and far-reaching conclusions about their quality.

The Inspectorate identifies a number of "serious weaknesses". These include: the admission of a "long tail" of poor achievers to courses that are intellectually ambitious; the narrow focus of much of the teaching, coupled with the narrow range of studies required of students; the failure of the teaching staff to ensure that the students study with appropriate rigour and the air of casualness that pervades the delivery of these courses; and the absence of a consistently disciplined approach to teaching and learning. Sir Keith must be very pleased. A poor concern.

The particular issue of quality raised by the inspectors' report has already become a topic of the politics of education. Whether the former's progress and the latter's impact has become an intensely political judgement

Yet there are two more general issues that arise from the long drawn out case of Sir Keith Joseph v. PNL sociology and applied social studies degrees. The first is the remarkable discrepancy between the views of the CNA and of the Inspectorate. The CNA inquiry, chaired by Dr Jack Earls, which was also set up following Sir Keith's earlier expression of concern, gave the courses an almost clean bill of health. The degrees themselves had recently been reapproved by the CNA. Of course it can be argued that the Inspectorate and the CNA have different functions. The CNA is a formal body which examines the formal structure and purposes of proposed degrees while the Inspectorate has the different duty, and capacity, to carry out less formal inquiries into their actual performance.

Yet the inspectors' report makes it quite clear that they have strong reservations about the organization of the degrees which the CNA has already approved. When all the diplomatic caveats have been peeled off, the fact remains that the CNA's findings, and the Inspectorate's, are in direct conflict. How is such a large difference of opinion to be explained and if possible resolved? Whose views should we trust - those of the academic bodies that make up CNA panels of experts, or those of the inspectors?

This question of independence is a revealing one. It is one too often that has not been reasonably posed. Higher education cannot survive without quality. Quality cannot survive without independence. Quality cannot survive without independence.

deans taking proper notes / too many notes? Have they had their hair cut? This is the second issue raised by the PNL's affair: is the Inspectorate qualified to make sophisticated judgements about the quality of degree courses? No one doubts that the inspector for nautical studies knows all that there is to know about nautical studies and that his accumulated expertise is therefore invaluable. But it is much more doubtful if the views of the Inspectorate about more general and academic subjects possess the same authority. It is difficult to know what to make of a seminar such as "Overall, lectures and seminars together provided a classic example of the pitfalls of 'unstreamed' teaching".

Two other thoughts. The polytechnic has placed considerable emphasis on the admission on non-traditional students and this emphasis has been enthusiastically endorsed by the Inner London Education Authority. The inspectors' report makes little attempt to conceal its lack of sympathy with this practice. Yet it is not clear that the expression of such political opinions is part of the constitutional business of the Inspectorate.

There must also be increased concern about the use to which inspectors' reports are being put. The decision to mark them public, presumably reflected an intention to spread good practice and to learn from mistakes. Yet they are increasingly being used in a negative and even intimidatory spirit. The eventual outcome of this short-sighted and illegitimate practice will be not only to compromise the neutrality of the inspectors but to provoke a more radical and more effective

Laurie Taylor



(A polite knock)
Wait.
(Long wait... Another polite knock)
All right. You out there. You can come in now. But make it snappy.

I'm very sorry to bother you but seem to have got a bit lost. I was trying to find...
Good God. You've not just arrived, have you?
Well, yes.

Have you completed registration?
No, I don't think so.

Then you must dash along to Q13 in H Block immediately. Get your i.e.a. forms signed and then straight on to D103 to hand in your Pink Reg. Form at the Media-Ling. Studies Office. Of course, if you're a Joint student - that is Joint Media-Soc. Media-Hist. Media-Pol or Media-Inf Tech, then you must... what name is it?
Erm... Noakes.

Is that with an 'M'?
No. An 'N'. Noakes.
Ah, N to Z. Then if you're Joint - except of course Media-Phil - then you'll need to be in P103 this afternoon with your DX3 photograph.

Ah.
And don't forget to take along your green A14 signed by your Super.
Super? Supervisor. Haven't you checked the Supervisors' Lists in S118 over in the Annex?

Not yet, No.
That is, of course, if your supervisor's not on research term. It's not M.L.K., is it?
Well, I haven't.

Or HTW - or SRP?
I just haven't had...
Because if so you'll need to be re-allocated and that'll be done in Biol. Labs Concourse on Day 2 of Week 1 between 10.25 and 10.35 immediately following Professor Lapping's introductory talk in B 615. All right?

Yes. Thanks very much.
So I'll probably run across you again sometime?
Yes, I hope so.

Unless, of course, you're contemplating a course change. Because if you are, time is of the essence. You'll need to check it out with the Chairperson in L8 and fill in a formal request to Change of Course Committee before half-past two this afternoon. Right. See you around then?

Yes, I... erm... just hope I'll be able to find my way back again. No problem at all. Just turn left into D Block - past Psychology and Computation - then up the stairs and I'm on the left with the big white notice on the door. "STUDENT INQUIRIES". You can't miss it.

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NAB gives way to poly pressure

by John O'Leary

A revision of the National Advisory Body's proposed plan for 1984/85 was under way this week after the NAB board had accepted demands led by the Department of Education and Science for a better deal for the polytechnics.

Although the bulk of the secretariat's recommendations were accepted at last weekend's meeting in Eastbourne, four important decisions remain for the board's final debate of the plan on November 8. Officials have been asked to investigate:-

● The transfer of hundreds of student places from small colleges into the polytechnics.

● The reduction of the proposed part-time student numbers by between 500 and 700 full-time equivalent places;

● The allocation of a further 2500 full-time students to polytechnics and certain large colleges in London and the south;

● The possibility of funding polytechnics on a more favourable basis than the colleges.

As expected, Mr Peter Brooke, under-secretary for higher education, announced at the meeting that the NAB would have an additional £20m to allocate in next year's advanced further education pool. An accompanying paper from the DES explained that the money was intended to increase access to courses and "to assist the NAB in facilitating the effective rationalization of the AFE system."

In fact, the board proposes to use the majority of the money to safeguard the funding levels in the public sector. The new student places will go where possible to science and technology courses in London and the Home Counties.

Civil servants pressed throughout the weekend for more concentration of places into "major institutions" and a new consultation exercise will take place on proposals to transfer courses where possible from neighbouring small colleges.

Official recommendations on part-time numbers had already been reduced by 800 full-time equivalent places before the board meeting, where DES representatives pressed for a further 2000 to be cut. Board members agreed to seek about a quarter of this amount.

No decision was reached or a fund-



ing system, although the board has asked officials to experiment with a system which would effectively provide separate pools for the polytechnics and colleges. The two types of institution were treated differently until last year and such a reversal would mean about 4 per cent more money for the polytechnics. The November meeting will also reconsider the original proposal for funding by academic programme and the DES alternative of basing budgets on 1982/83 pool allocations.

Board members refused to renege on Nonington or West Midlands colleges, although the complication of teacher training courses at both West Midlands and Hertfordshire College of Higher Education may mean delays in the final determination of their fate as institutions.

Mr Christopher Ball, chairman of the NAB board, said he had not altered his view that the future of six institutions was in jeopardy. He added that the weekend meeting had shown that the NAB could work and that the board would take difficult decisions. A commitment at least to consider a step similar to that taken by the University Grants Committee during its rationalization exercise, issuing guidelines on the protection of libraries and other central services, was given by Mr Ball during talks with a delegation led by Mr Neil Stewart, the NUS president.

The National Union of Students demonstrated outside the meeting (above). A delegation met Mr Ball (pictured right with Mr Stewart), and was told that the NAB board would consider recommendations to institutions to protect libraries, and student unions.

Public sector research 'essential for standards'

by Karen Gold

Validation of public sector degree courses will be put in jeopardy if staff teaching them do not do enough research, warns a draft policy paper on research issued to polytechnics and colleges today by the Council for National Academic Awards.

The report was drawn up by a CNA working party which was set up in 1981 to look at research in the public sector. It argues that universities and public sector institutions doing degree-level work "cannot... be distinguished on any ground of principle in their concern for research, although there may be differences of content and emphasis".

"Moreover, the council does not accept that, given a wide range of course content and objectives, there can be a useful division between institutions 'which concentrate on teaching at undergraduate level and those which concentrate on research'."

All staff involved in teaching CNAA-validated courses should be engaged in research, says the paper. It defines research as encompassing fun-

damental and applied research, consultancy, professional practice, scholarship in the arts and humanities, creative work in the arts and curriculum development and related activities.

The council sees it as essential to raise the level and quality of research activity across the board. Where there is inadequate research activity course approvals are placed in jeopardy.

The paper recommends more flexibility by the Burnham committee in appointing staff with "reader" status. Applied rather than fundamental research should be the staple concern of public sector research, the report says, with an emphasis on consultancy in business fields and interdisciplinary work particularly in technology. Institutional management should not discriminate against research in the arts and humanities, education and social sciences.

The council plans to approach the National Advisory Body and the Department of Education and Science about a central policy for funding research.

Leader, back page

Scientists in power struggle

by Paul Flather and Jon Turney

A power struggle involving research council heads, Whitehall chief scientists, and the Advisory Board for the Research Councils is developing over new proposals on how strategic research should be commissioned.

Research council chairmen and secretaries are preparing to fend off proposals put forward by Sir Ronald Mason, former chief scientific adviser at the Ministry of Defence, now professor of chemistry at Sussex University which would give some of their budgetary powers to the ABRC. The Mason report on commissioned research is being studied by Sir David Phillips, the ABRC chairman. Copies are with Government ministers and Dr Robin Nicholson, chief scientist at the Cabinet Office.

The main proposals amount to greatly strengthening the influence and role of the ABRC in directing and commissioning "strategic" research, defined as medium term research lying between the "fundamental" and "applied" research outlined in the 1971 Rothchild report.

The Mason report proposes that:-

- Whitehall departments hand over a fraction of their science budgets for research commissioned by the ABRC;
- The ABRC gains powers to earmark certain research council funds for specific projects;
- The ABRC gains a pivotal role as information centre for all strategic research planning.

The proposals, to be put before the ABRC on November 2, are already provoking hostility from Whitehall chief scientists and research council chairmen.

Sir Ronald's study, carried out speedily in time for this year's science budget was formally to examine the effect of the Rothchild "customer-contractor" arrangements on the research councils.

Sir Ronald carried out 46 interviews, including talks with the main protagonists in the original debate on the customer-contractor principle: Lord Rothchild, Sir Frederick Dainton, and Sir Frederick Stewart. He told THE TIMES: "I am sure the report will raise the average temperature."

While there has been general concern over the effectiveness of links between Whitehall departments and individual research councils, the Mason proposals have wider implications which are not to the councils' liking.

They are in line with Sir David Phillips' view that the ABRC should get more involved in development of science policy - already manifest this year in a more detailed, two-stage approach to the science budget "forward look".

But the heads of research councils will argue that the ABRC will never have the expertise to direct research funds in detail - which resides only with the individual councils.

However, other recent developments all point to a stronger role for the centre in setting priorities. They include the expansion of the science secretariat in the Cabinet Office, joint reports by the chairman of ABRC and the Advisory Council for Applied Research and Development, the recently instituted annual review of the whole of Government research and development, and a significant increase in the number of independent members on ABRC.

Sir Keith soothes the social scientists

by Paul Flather

Sir Keith Joseph, the Secretary of State for Education, has made an unexpected intervention to try to allay fears still harboured by many social scientists about further cuts.

Sir Keith has written to Sir Douglas Hague, the new chairman of the Social Science Research Council, making it clear that no further inquiries into social science are planned and that after 1985 the council will not be treated differently from other research councils.

The SSRC has effectively been on parole for three years following last year's inquiry carried out by Lord Rothschild. Sir Keith's letter now clears away all future hurdles beyond

the three-year guarantee given in his response to the Rothschild report.

Sir Keith now writes that the interests and disciplines within the council's scope are "unquestionably important, inherently difficult and properly find a place in higher education, research and scholarship".

The letter was requested by Sir Douglas after he had noted lingering and real suspicions felt by many social scientists about the future. He felt he would be better equipped to promote social science with a clear ministerial commitment in his hand.

Sir Douglas is particularly pleased with Sir Keith's express statement in the letter that the council "should encourage excellence regardless of current orthodoxies".

This will give Sir Douglas a free hand to support first class research regardless of its origins. In particular this means more research from a "free market" approach, as opposed to a "statist" or "Keynesian" approach.

Fears that the council had in its first 15 years supported too much of the latter kind of research led Sir Keith, supported by Sir Geoffrey Howe, now the Foreign Secretary, to set up the Rothschild inquiry in the first place amid widespread rumours that the council was about to be abolished.

The appointment of Sir Douglas, a friend, who shares many of his ideas, will have done much to assuage Sir Keith's own suspicions about the council.

Sir Keith says that he cannot give

any guarantees on future funding once the council has been contracted to a smaller size by 1985/86. He has asked for cuts amounting to about 4 per cent in real terms by that time, making a total fall in the SSRC budget of about one third since 1979.

But he makes clear that from 1986/87 the Advisory Board for the Research Councils will resume its role of advising on the size of the council budget.

Sir Douglas said this week that the letter amounted to a new beginning for the council. "I almost see this as a new charter for the council. We can now go ahead and promote excellence in research and help build a new orthodoxy without worrying about the future."

'Reform farming research'

by Jon Turney
Science Correspondent

The Royal Society has offered qualified support to the Agricultural Research Council in response to reports which call the council's future into question.

In a memorandum submitted to the Department of Education and Science and the Ministry of Agriculture, the society says there is an urgent need for reform of agricultural research and development in England and Wales.

This backs the judgment of the earlier reports, one from the House of Commons Agriculture Committee and one from the Joint Consultative Organization for Research and Development in Agriculture and Food (JCQ), which advises the Ministry of Agriculture. Both of these reports called for a new, central body to preside over agricultural research, in place of the present division of responsibilities between the Agricultural Research Council and the agriculture ministry.

The memorandum, prepared by a working party chaired by Professor David Smith, the society's biological secretary, says such a body "could be established by expansion of the functions currently discharged by the ARC". This is in line with the group's strong opposition to any move to take agricultural investigations out of its present research council system. Funded through the DES, in previous years the memorandum criticized the JCO's suggestion that the new body should be funded entirely by the Ministry of Agriculture.

The society also raises other possibilities, including a Biological Research Council which would incorporate some of the responsibilities of the Natural Environment Research Council, the Nature Conservancy Council and the Forestry Commission, although they concede this is probably not up for discussion now.

The memorandum is likely to carry weight as Professor Smith, a member of the ARC for some years, was also a member of the JCO board where it began to develop the ideas in its report on agricultural research, although he was not a signatory to the report. Professor Sir Hugh Ford, who led the earlier report, was also a member of the Royal Society working party.

The memorandum echoes some of the two reports' criticisms of the ARC, especially the charge that it is too bureaucratic. But it is much more critical of the Ministry of Agriculture, for poor policy guidance and unconstructive use of the arrangements for commissioned research. Overall, the document amounts to a strong argument that any reorganization should be accomplished within the research council system.

A Government response to the two reports is unlikely before consideration of the recommendations of Ronald Mason's current inquiry into the arrangements for commissioned research in all five research councils.

New adult education unit cast in an unknown role

by Felicity Jones

The National Institute of Adult Continuing Education plans to set up a separate unit to take over the work of the Advisory Council for Adult and Continuing Education which winds up finally at the end of the month.

But discussions over NIACE's exact role at the executive committee meeting last week were inconclusive and papers prepared by officers and the chairman were referred back to be resubmitted to the next council meeting. The officers have been given delegated powers to continue discussions with the Department of Education and Science.

Although the executive committee has accepted the DES's invitation to take over ACACE's activities, with the regret that a development council is not going to be established, NIACE's role is still clouded in uncertainty. Until it knows exactly which parts of ACACE's remit the department intends to hand over, the committee considered it to be impossible to budget for the new unit or take any firm decisions on staffing, the administrative needs of the institute and the terms of reference of its committee and other organization details.

It is understood that although additional money of up to £50,000 is on the table to develop a new unit at NIACE there is still no firm commitment to provide additional cash to cover the extra burden on the institute.

The local authority associations have still to be consulted formally about the role the institute will take and discussions at officer level are scheduled within the next week.

Meanwhile it looks as though ACACE will pass out of existence without any Government announcement about the future development of adult and continuing education. It is now expected that an official announcement will be made early in the next session of Parliament.

Mr Noel Thompson, DES under secretary, had a rough ride when he attended the final meeting of ACACE last week since members felt that the department had done too little to further the idea of a development council.

He was unable to enlighten them about the exact nature of the successor to ACACE. The present bitter debate about public expenditure budgets has delayed the decision about development work on continuing education.



"So, naturalists observe, a flea hath smaller fleas that on him prey...". Hull University research technician Cath Ellis's prize-winning photograph showing tiny mites on the back of a hedgehog flea, *Archaeopsylla erinacei*, perfectly illustrates Swift's poem. Ms Ellis and Roland Wheeler-Osman, photographer in Hull's department of zoology, both won first prizes in this year's Institute of Science Technology international photographic competition.

SERC's journey into space

Professor John Kingman, chairman of the Science and Engineering Research Council, this week signed contracts which secure British participation in two important scientific space missions.

He went to Bonn with Mr Peter Brooke, under secretary at the Department of Education and Science, to confirm that the SERC will spend more than £11m on the ROSAT X-ray astronomy satellite and a second mission to study the interaction of solar radiation with the outer reaches of the earth's atmosphere.

The contracts will cement collaboration with the United States and West Germany on the two missions. ROSAT, due for launch in 1987, accounts for most of the British cash. Our £10m contribution will pay for a new X-ray telescope being developed by Leicester and Birmingham universities, Imperial College London, and the Mullard and Rutherford-Appleton Laboratories.

The ROSAT mission looks like being the only X-ray observatory in orbit in the late 1980s and will strengthen the European position in this field, in which Britain has a high reputation.

The smaller mission, due next August, is called AMPTE, for Active Magnetospheric Particle Tracer Explorers. It is designed to record the production of charged particles in the upper atmosphere - including those which produce the Northern Lights. Three instruments, one each from the United States, Britain and West Germany will be released from an American rocket.

Dr Ashley Catterall has been appointed secretary of the SERC from November 1. He succeeds Mr Brian Oakley, who left the council earlier this year to run the Alvey computer research programme from the Department of Trade and Industry. Dr Catterall has been deputy chief scientist at the Department of Energy since 1981.

Stirling students clash over CND rally

A legal battle was being fought this week over Stirling University's Students' Association sending supporters to tomorrow's Campaign for Nuclear Disarmament rally in London.

The association was to hire three buses for students at a cost of more than £1,500. But the university's chairman of Stirling University's Conservative Association, sought an interim interdict to prevent this on the grounds that it was a misuse of student funds.

Mr Kerr was backed by the Scottish

Federation of Conservative Students which warned that Stirling, which breached guidelines issued last week by Sir Michael Havers, the attorney general, saying that funds from the university block grant could not be used for political campaigns, although money from fund raising could.

The National Union of Students (Scotland) was seeking legal advice this week on whether these guidelines also applied to Scottish unions whose power comes from their university courts.

However, an emergency court meeting of Stirling's students association on Tuesday decided not to pay for the buses through union funds but to raise as much money as possible between then and the rally. It was hoped to raise enough for two buses. It was thought the Conservative students intended to seek an interdict against the association in organizing buses for the rally, and the association lodged a caveat to ensure there would be court hearing before an interdict could be brought.

Now inspectorate is criticized for idealism and bias

Conservative-run Sutton borough is to object to the Secretary of State for Education and the Department of Environment about a critical and belated Her Majesty's Inspectorate report published this week.

Dr David Trafford, leader of Sutton Council, says the report should be used for being idealistic and politically motivated. He says the authority is not a narrow, curriculum approach, particularly at A-level, and

sufficiently stretch pupils. This is the second public rebuff the inspectorate has experienced this month. The first concerned its report on the Polytechnic of North London.

The Sutton report followed a full inspection carried out between 1979 and 1982. It criticizes the authority for giving a better deal to grammar school pupils for its narrow, curriculum approach, particularly at A-level, and

But the inspectorate is fairly complimentary about the borough's further education policy. It found little to criticize except for some duplication of courses at Carshalton Further Education College and Sutton College of Liberal Arts. It also pointed to poorer than national average results in science

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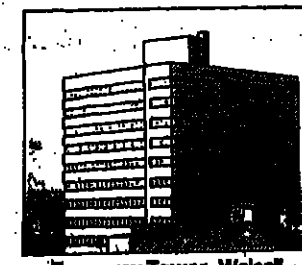
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De La Salle inquiry 'a sham'

by Patricia Santinelli

Sir Keith Joseph, Secretary of State for Education and Science, was accused this week of conducting an unjust and sham consultative exercise over the future of De La Salle College, Manchester, by Bishop Daniel Mullins, one of the institution's governors.

At the beginning of this month, Sir Keith stunned the college and the Roman Catholic community by announcing that De La Salle would after all lose its teacher training by 1984, thereby reducing at one stroke the Catholics' "historic" share of training places. His decision followed a review whose setting up had led to a general belief in the college's survival.

In a letter to Sir Keith, Bishop Mullins, who is also chairman of the Department for Catholics in Higher Education, says that the major reason for the closing of teacher training at De La Salle - namely that its places were not needed nationally and that such places could not be diverted

from other institutions - must have been known before the review started. "If this means anything, it means that you had already made allocations on the assumption that De La Salle had no place in the teacher training provision and that such an assumption could not now be challenged," he says.

"If that was the basis of your review, the whole exercise had to be meaningless and the conclusion was already pre-determined. I cannot see that this represents justice or adequate consideration of the reasons for the case put forward by the bishops and the college."

Bishop Mullins also accuses Sir Keith of misrepresenting the Catholics' arguments over the historic share of training places. He points out that the concept was originally proposed by the Department of Education and Science and accepted by Catholics because it was equitable.

"You now seem to claim that the basis for consultations can be changed by a departmental fiat. If that be so, we ask what are the bases on which

consultation shall be undertaken in the future. We cannot have any confidence in a situation in which, without even prior reference to us, the ground rules regulating the relationship between the department and the church are unilaterally changed."

Bishop Mullins says he is surprised at Sir Keith's misunderstanding about craft design and technology provision at De La Salle being an argument for its survival or about his assumption that all secondary teachers in Catholic schools are recruited solely from Catholic colleges.

"We have accepted for sometime that we could not possibly recruit sufficient numbers from our colleges and for this reason we have been developing other routes," Bishop Mullins says.

"But even with an increase in secondary PGCE places we recognize that we could not hope to meet all the subject needs at all levels of our schools."

Academics to learn patent law

Caroline jams the air waves

by Jon Turney
Science Correspondent

Academics need to be taught about patent law if universities are to profit from new inventions, especially in light of the Government's decision to rescind the British Technology Group's rights over publicly-funded research.

This is the view of Mr Keith Sellar of Aberdeen University and he intends to make sure that it is among the first institutions to take steps to bring this about.

A booklet about to be published will explain to all the university's staff their position under the 1977 Patent Act. The university's administration is now finalizing guidelines for protecting inventions arising from the work of university employees.

Mr Sellar has a hand in both initiatives, as he combines the posts of chief executive of Aberdeen University Research and Industrial Services, a private company owned by the university and of university solicitor. As a commercial lawyer in the Middle East for 30 years, he was quickly aware on his return to Britain that higher education institutions here were lax about securing rights to new ideas.

The same problem concerns the Department of Trade and Industry, where official fear that the dissolution of the BTG's monopoly could leave the way open for overseas companies to cream off British inventions. Securing university rights will not stop this happening, but it is an essential first step.

It will also have financial advantages, according to Mr Sellar. "Without any doubt, one of the main assets of any university in future will be the proper development of intellectual property - which has so far been sadly neglected," he said. The booklet prepared by the AURIS board was a first step, and would explain employer and employees' rights under the 1977 Act, how patent protection operated and the different kinds of licensing arrangements.

In addition, the university's new guidelines would make sure that if anyone on campus had a promising idea or device they would inform the university first and the administration would then decide whether to seek a patent. Mr Sellar said the BTG might well be consulted at this stage, as they still had the largest store of expertise on such matters relevant to university work.

Final removal of the BTG's rights over work funded by the research councils is still some months ahead. The Department of Trade and Industry wants to lay down new guidelines before the existing arrangements are dissolved.

Illegal broadcasting by Radio Caroline is jeopardizing the future of half of Britain's student radio stations. Since for three years since its original 963 kHz (312 m) with a new ship and extremely powerful transmitter.

It is a frequency which European governments can allocate for low powered domestic broadcasting. The student stations, designed to broadcast within campus limits only, have been swamped by the power of Caroline's transmissions.

The stations are faced with three choices. They can change frequencies, which is extremely expensive and time-consuming; they can broadcast illegally on VHF; or they can simply close down. The two alternative frequencies for student use are rendered virtually unusable by other stations.

Four weeks ago the Home Office offered the affected stations a new frequency - 1,602 kHz (187 m). But Richard Siver, who chairs the National Association of Student Broadcasting, said: "The change to 1,602 will be a hell of a jump. It will mean rebuilding a lot of transmission equipment at great expense and some stations just aren't going to make it."

The 1,602 frequency is at the very end of the medium waveband and out of range of the radios that many students use.

Caroline's programmes cause most havoc at night, which is peak audience time. The worst-hit stations are at the universities of Stirling, Surrey, Loughborough and Hull.

Loughborough Campus Radio, built last year for £50,000 was sunk before even started broadcasting. University Radio Nottingham's transmissions are being obliterated at night; the change to 1,602 would cost £4,000, "which we will never be able to afford".

University Radio Essex spent £2,500 changing to 963 two years ago and is now moving back to 999 at a cost of £2,000. University Radio Hull, the newest student station, are also switching despite interference which will prevent many students from receiving the station.

Many student stations are angry at what they see as inaction on the part of the Home Office and the Department of Trade and Industry, who are jointly responsible for student radio.

"We do understand the problem and are trying to make the best of a bad job," said a Home Office source. Caroline is broadcasting from international waters, over which the Home Office has no jurisdiction.

The Home Office has refused to jam the pirate's signals and the only action it can take is to arrest members of the crew who set foot on British soil.

Lecturers launch council to oppose disarmament

More than 200 university and polytechnic lecturers have signed an open letter to the academic community declaring their opposition to the arguments of the Campaign for Nuclear Disarmament and its allies.

The letter has been sponsored by the Academic Council for Peace and Freedom, a group launched this week to oppose "one-sided disarmament by Britain and the West and convinced of the value of the Atlantic Alliance for preserving world peace".

The academics claim in their letter that unilateralist campaigners have been selective in their use of facts and have sometimes "sought to promote fear and hysteria" over a complex issue.

"We believe we are not faced with a choice between surrender to the Soviet Union and a nuclear holocaust," they say, and go on to accuse CND of casting slurs upon the motives and moral sense of those who reject its case.

The charges were immediately rejected by Monaghan, Bruce Keith, general secretary of CND. "We have always used proper sources. We have not falsified facts. If anything we have been the worst victims of slurs," he said.

Leading lights in the new policy include Dr Roger Scruton, of Birkbeck

College, London, Professor David Regan professor of politics at Nottingham University, who is the treasurer, and Professor Julius Gould, professor of sociology, also of Nottingham, who is vice chairman. Lord Vaizey, formerly of Brunel University, has been elected president.

Other signatories of the letter which appears as an advertisement in this week's *THES* include Professor Michael Howard, regius professor of modern history at Oxford University, Lord Dacre, master of Peterhouse, Cambridge, Lord Blake, provost of Queen's College, Oxford, and Professor J. P. Kenyon of St Andrews University.

Sir Alec Merrison, vice chancellor of Bristol University, and Sir Sam Edwards of Cambridge University, former chairman of the Science and Engineering Research Council, and Professor Ian Jack of Cambridge are also signatories.

Mr David Levy, sociology lecturer at Middlesex Polytechnic and secretary of the council said he was delighted by the "enthusiastic response to the open letter. A series of seminars and meetings were being planned, including at Nottingham this week, including a contribution to a Soviet policy forum.

ADVERTISEMENT

AN OPEN LETTER TO THE ACADEMIC COMMUNITY

We, the undersigned, being teachers in British Universities and Polytechnics, wish publicly to declare our opposition to the arguments which the Campaign for Nuclear Disarmament and its allies have been presenting in British institutions of higher education.

It seems to us that the unilateralist campaigners have been selective in their use of facts and have sometimes sought to promote fear and hysteria over a complex issue of public policy. We believe we are not faced with a choice between surrender to the Soviet Union and a nuclear holocaust. The main task of statesmanship is precisely to avoid this choice. The case for maintaining the effective defence of Britain and the West through the retention of nuclear weapons is overwhelming unless and until we are able to reach a satisfactory agreement on measures of multilateral disarmament, and their verification, with the USSR.

The approach of organisations such as CND, far from promoting rational debate on such matters, has been to cast slurs upon the motives and moral sense of those

who reject its case. The appropriation of the word "peace" by one side - as when CND calls itself "the peace movement" - suggests that the opposition to unilateralism implies the advocacy of war. Questions of the defence of the nation and the preservation of peace cannot be resolved by appeal to a false moralism that takes no account of the prevailing international circumstances. In particular, rational consideration must take account of the nature of the USSR and the special kind of threat it poses to the survival of the West as a community of free nations. We cannot accept the unilateralists' claim that the preservation of peace within Europe since 1945 can be dissociated from the West's willingness thus far to retain sufficient arms to deter Soviet expansion. We believe that the measures demanded by the CND, far from serving the cause of peace, would encourage aggressive tendencies endemic in the Soviet system.

We therefore stress the importance of open and rational discussion of these matters, confident that the causes of peace and freedom are best served by our continuing active participation in our international alliances and by rejection of all measures of one-sided disarmament.

Dr L. Ackroyd

(Civ. Eng.) Nottingham

Dr R. D. Adams

(Mech. Eng.) Bristol

Dr G. M. Ahern

(Art) Open University

Mr J. W. Alcock

(Physics) Bristol

Mr J. R. W. Alford

(History) Bristol

Mr Lincoln Allison

(Physics) Warwick

Mr P. S. Alpin

(Physics) Bristol

Dr R. G. C. Arridge

(Physics) Bristol

Dr R. Atkins

(Physics) Bristol

Dr R. H. G. Aubrey

(Physics) Bristol

Dr C. E. Ashworth

(Sociology) Leicester

Mr Barrie Asford

(Law/Pol/Econ) Oxford Poly

Mr P. M. Bacon

(Social Admin.) Hull

Mr A. J. L. Barnes

(Government) LSE

Rev Dr D. C. Barrett, SJ

(Philosophy) Warwick

Dr T. H. K. Barron

(Theology) Hull

Dr D. R. Bell

(Civ. Eng.) Cambridge

Dr C. M. Edwards

(Economics) Exeter

Lord Blake

Provost, Queen's Coll., Oxford

Mr Andrew Borkowski

(Law) Bristol

Prof A. A. Bond

(Philosophy) Glasgow

Dr R. Bradshaw

(Geography) Nottingham

Mr C. E. Brannan

(Mod. Russian Hist.) Manchester

Prof Neville Brown

(Pol. Sci.) Birmingham

Mr J. Butler

(Politics) Warwick

Dr R. Burt

(Economic History) Exeter

Prof F. N. Butcher

(Physics) Warwick

Prof R. Cameron

(Physics) Nottingham

Prof Peter Campbell

(Politics) Reading

Mr Barry Carter

(Humanities) Oxford Poly

Mr W. R. Chalmers

(Classics) Nottingham

Dr D. Chas

(Physics) Bristol

Prof Gordon Cherry

(Social Science) Birmingham

Dr Francis Clark

(Rel. Studies) Open University

Mr C. G. A. Clay

(History) Bristol

Dr J. H. Coates

(Economics) Exeter

Prof A. R. Collar FRS

(Engineering) Bristol

Dr Bruce Collins

(Modern History) Glasgow

Dr R. A. Cooper

Branmore College, Oxford

Dr D. C. Corner

(Economics) Exeter

Dr W. M. Cottingham

(Physics) Bristol

Dr John Cox

Director

(Nursing Educ. & Resch.)

Chelsea Coll. London

Mr Richard Cronin

(English) Glasgow

Lord Dacre of Ganton

Master of Peterhouse, Cambridge

Dr C. Dandeker

(Sociology) Leicester

Mr R. C. H. Davies

(Sociology) Reading

Mr F. K. Dawson

(French) Nottingham

Mr J. P. Day

(Philosophy) Keele

Mr David Deacon

(Law/Pol/Econ) Oxford Poly

Prof Norman Dees

(Adult Education) Glasgow

Prof D. L. Dingley

(Sociology) Bristol

Mr D. Dingley

(Physics) Bristol

Mr R. N. Dixon

(Chemistry) Bristol

Prof K. P. A. Drew

(English) Glasgow

Prof G. Duncan Mitchell

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Mr Douglas Eden

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(Sociology) Exeter

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(Modern History) Glasgow

Dr R. S. Gilmour

(Physics) Bristol

Miss A. Glynn-Jones

(Geography) Exeter

Dr J. L. Manning

(Politics) Durham

Dr John Martin

(Physics) N. Lond. Poly

Mr Alan R. Grant

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(Modern History) Glasgow

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(Sociology) Exeter

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(English) Univ. Coll. London

Mr Richard Jenkins

(Classics) LHM Oxford

Mr Trevor Jones

(History) Keele

Mr H. F. Kay

(Physics) Bristol

Prof A. Keller FRS

(Physics) Bristol

Dr Gavin Kennedy

(Economics) Strathclyde

NUS seeks closer links with unions

by David Jobbins

The National Union of Students is seeking closer and more formal links with the trade union movement. In the past, contacts with the TUC and trade unions outside the educational field have been limited to discussions at officer level or occasional ad hoc meetings. But the NUS believes that the development of the Youth Training Scheme in particular requires a more effective channel of communication.

Mr Neil Stewart, Labour president of the NUS, has already called for meetings with the general secretaries of five big unions with members in industry and the public sector to discuss joint membership arrangements for YTS trainees.

The NUS feels that cooperation is needed to help trainees with work and college-related problems. In a letter to Mr David Barrett, leader of the General Municipal, Bakers and Allied Trades Union, Mr Stewart said that many trainees will bring their work-related problems to student union officers during their off-the-job training.

"Student unions are not equipped to deal with these many work problems."

This point of contact however will provide an opportunity for many of those young people to be organized," Mr Stewart said.

Similar letters have gone to the general secretaries of the National and Local Government Officers' Association, the Association of Scientific, Technical and Managerial Staffs, the Transport and General Workers Union and the National Union of Public Employees.

This week Mr Stewart called for a meeting with Mr Len Murray, the general secretary of the TUC, and members of the general council pointing out the advantages to the big industrial unions of the arrangements the NUS has with the National Union of Teachers and other teaching unions. Under these union contracts with trainee teachers are made.

"It would be quite possible for NUS to continue individual discussions with particular unions but we feel very strongly there should be some overview," Mr Stewart said.

The NUS executive did not decide on the appropriate mechanisms, but some members favour observer status on TUC committees such as those on education and organization.

News in brief

Law under one umbrella

Edinburgh University has launched a new interdisciplinary centre for legal studies, amalgamating the jurisprudence and criminology departments whose staff will continue teaching work in the law faculty. The new centre also includes the former inter-faculty school of criminology and forensic medicine, and its 20 research staff come not only from other law departments but from the arts, social science and medical faculties.

"Its research work will range across criminology and forensic studies, the sociology of law, social policy and law, and jurisprudence and the philosophy of law."



Marathon woman
Brighton Polytechnic sports science student Sarah Rowell (above), who won the women's marathon in the World Student Games earlier this year, left for the United States this week to run in the New York Marathon.

Shy of retiring

Only 38 members of staff at Queen's University, Belfast, have opted for early retirement or lump sum severance under a scheme launched last year. Twelve academics and 21 other employees have decided to take premature retirement; another four academics and a member of the computer staff have accepted voluntary redundancy.

Gay conference

Despite last minute doubts that it would take place the National Union of Students is holding its first national conference on gay and lesbian rights at Queen's University, Belfast, this weekend. The conference, held in Northern Ireland to pinpoint anti-homosexual attitudes in the province, has been opposed by Loyalist groups.

Parkes speech

A full version of the speech given by Sir Edward Parkes to the Committee of Vice-Chancellors and Principals will be published in the University of Leeds Review later this term.

Fellowship issue still in balance

by Paul Flather

The future of a senior Cambridge University don who has been fellow of Peterhouse College for more than 20 years, still hangs in the balance after an inconclusive meeting of college fellows last week.

Lawyers are now involved in the case of Dr Hallard Croft, aged 47, director of studies in mathematics, who was struck off the list of fellows due to be re-elected last term and still not been reinstated.

Fellows are put up for reelection every five years and by convention the matter is a formality. But Dr Croft's name was removed from the reelection list following a very strongly worded letter he sent to Lord Dacre, master of the college, saying he would only carry out his minimum teaching duties in future.

The case could now be decided at a further meeting of college fellows next week, hinging on whether Dr Croft's strong criticism of Lord Dacre's headship amount to grounds for constructive dismissal.

It is understood that the number of fellows on each side of the case is very evenly balanced.

At the root of the row is a feeling among some Peterhouse fellows that Lord Dacre's arrival three years ago has strained college relationships. Lord Dacre is pressing for Dr Hallard not to be re-elected.

Such a decision would cost Dr Croft his right to rooms in the college and also dining rights. But his position as a university lecturer would be unaffected.

Officer appointed

Mr Robert Morris, 43, has been appointed vice-president of the Association of Metropolitan Police Officers.

Careers advice trebled

The Manchester-based careers advisory service for graduates has more than trebled its supply of the register of careers and training opportunities it distributes to make one available to every three students.

Roger 84-the Register of Graduate Employment and Training-is published by the careers services unit of the Association of Graduate Careers Advisory Services. Before last year it was distributed only as a reference work to all university, polytechnic and college careers offices.

Last year 10,000 copies were printed, and according to Mr David Ward, consultant for Roger 84 and appointments officer at the university of Essex, "it was still so great that this year it was decided to print 35,000."

The publication allowed employers

Design education 'not to blame'

by Felicity Jones

Britain's commercial failings cannot be blamed on design education, according to a survey commissioned by the Department of Education and Science in association with the Design Council.

The research project, *The Industrial Design Requirements of Industry*, sought to identify what skills, knowledge and attitudes industry were required from industrial designers and whether these requirements were being met. The managements of 85 British and 30 European manufacturing companies were interviewed to find out the designer's role within the company and whether this matched its needs.

The project was triggered by the 1977 Carter report on industrial design education which found a mismatch between design education's output and industry's needs. It recommended that the two should be brought closer together.

Accepting that Britain was losing

ground in home and export markets against foreign manufacturers, the research wanted to discover whether the performance of industrial designers was the prime cause of this decline and whether better education would make any significant improvement.

Two hypotheses were tested to see whether training helped designers to understand the manufacturing process and market forces. The research uncovered considerable criticism of design education but discovered that companies on the continent had the same criticisms about the need for greater commercial and technical skills. If anything, the performance of European designers was considered worse.

The second hypothesis was that British designers were insufficiently aware of the relationship between design and profits. Though the research supported this view it revealed that the situation on the continent was also worse.

Both hypotheses were found to be true in that improvements in design

education could be made but they were also false in that they could not explain why European companies were doing better in the market.

The authors, Chris Hayes Associates, said: "It would be wrong to lay the blame for our present commercial shortcomings on design education in the UK. On the contrary, design education is regarded as superior anything available in their own country."

The research was carried out with consultation with a steering committee which included Professor Brian Wolfson, professor of design management at the Royal College of Art, Peter Matthews, head of the art and design school at Central School of Art and Mr Herbert Berry, head of design at Buckinghamshire College Higher Education.

The Industrial Design Requirements of Industry, available from the Design Council, 28 Haymarket, London SW1Y 4SU, £7.50.



Safe on dry land: R.V. Prince Madog, of the University College of North Wales recently rescued 12 people who were stranded on an island with only two days' food supplies. They were staying at Bardsey Island, off the Lleyn Peninsula when bad weather forced back the boat sent to return them to the mainland.

One of the party, Joan Lewis (centre), who works in the department of physical oceanography and the department of marine science at Bangor, sighted the Prince Madog going through the Bardsey Sound and sent a radio message to the ship. Captain Thomas Donovan (right) who was on board with Professor Lewis (left), turned course to rescue them.

Merger agreement drawn up

The senates and councils of King's, Queen Elizabeth and Chelsea colleges in London have been considering an interim agreement which will give legal effect to their merger.

It has been unanimously recommended by the joint policy committee of the three colleges, on which all three principals sit.

In a statement to the councils the committee says: "Your joint committee is in no doubt that the current level of Government funding for universities is under severe pressure and it is far from surprising that higher education will escape further substantial reductions in the level of that support during the lifetime of the present Government."

"The gathering prospect of differentiation between institutions is but one of the fundamental changes which ominously threaten the university system as we know it. Against this background your committee has set itself the task of ensuring that the three colleges in the knowledge that by this means alone can academic

prosperity and financial security be assured.

The committee has recommended that the combined college be called King's College, London, and that a principal should be appointed to take office from August, 1985.

Under the interim agreement each college will continue to operate as a separate legal entity until the unified college is incorporated. They will cooperate as closely as possible in the teaching of students, sharing their buildings and running costs.

The colleges will send observers to other colleges' councils. If the colleges fail to agree a major difference will be declared, which will be referred to an arbitrator, most likely to be the King's visitor.

The joint committee has also recommended a management structure for the new college, including planning groups for academic affairs, financial and personnel matters, and sites. The latter would be charged to prepare a strategic plan for a unified site, including the procurement of parts of Somerset and Courtwell Houses.

Communist resigns post

The sole Communist on the executive of the National Union of Students has resigned but the party will fight to retain the seat in a by-election at the union's Christmas conference.

Ms Janice Robinson won a preliminary place on the executive for the Left Alliance at Easter and managed the return of a Communist Party member after a 12-month absence.

But the three-way demand of the final year studies, her 10-month-old son and her NUS duties forced her decision. She is bitter that the NUS with its public commitments to women's rights and wider access to higher education, seemed unable to adapt to her needs.

"There is no room within the executive for someone who is both a mother and a full-time student," she says. Ms Robinson, a final year student at Essex University, added: "Because I have successfully managed to carry out my duties as a student union president at Essex, and be a mother I thought it would be possible to be a part-time NUS member and student."

Although the NUS constitution does not provide for by-elections between Easter conferences, it does allow co-option in a non-voting capacity.

This week the NUS executive, after accepting Ms Robinson's resignation, agreed to hold a straw poll of delegates and to co-opt the winning candidate.

Urgent talks are now underway between the Party student organizer, leaders of the Left Alliance to agree a seat for the party on the executive. The loss of a CP member on the executive, however temporary, is a further blow to the left. Workers' decision by the Socialist Workers' Party to move away from the national student politics and the seceding of the Socialist Student Alliance only the National Organisation of Labour Students and the

Nigerians suffer money problems

Aid agencies in Britain are anxiously awaiting practical evidence of a hardship fund for Nigerian students announced in Lagos early last month. Many Nigerian students registered for courses at British universities and polytechnics have not received money from Nigeria.

One agency in the West Midlands, the International Family Service for Overseas Students, has already paid out £2,000 in emergency loans. Universities and polytechnics in the region calculate they have owed an accumulated £116,000 by last 74 of the 250 students in the West Midlands.

The United Kingdom Council for Overseas Student Affairs is organizing a seminar in London on November 30 to brief student union welfare officers and university and polytechnic financial

THE LSE's new history man gets down to business



by Paul Flather

A strong appeal for British universities to start taking business history as seriously as Japanese and American universities has come from Professor Leslie Hannah, who holds the only established chair in the subject in Britain.

He said the absence of historical studies of companies like Courtaulds and Pilkington was striking in British universities, while Harvard had had a chair and a journal in business history for more than 50 years and a research centre since the 1950s, and Japan had 15 university chairs and 30 private ones.

Professor Hannah (left) made his remarks during his inaugural lecture at the London School of Economics last week. He was appointed to his

chair last year, and since 1978 has been director of the Business History Unit housed at the LSE.

He said business history had perhaps been shunned here because it was not considered a proper subject for gentlemen. "Is the business historian perhaps too closely connected with 'trade' for it to be desirable to let one's daughter get too close to him?" he asked.

Professor Hannah noted how the first commerce course at Birmingham University before the war had attracted many Japanese, and how Mitsui of Japan was the largest donor to a new chair in commerce.

He pointed to the contrast in fortunes between Marks and Spencer, which has recruited graduates for 50 years, and Woolworths,

which has not.

Professor Hannah's unit was set up in 1978 after £250,000 was raised in an appeal to industry aided by Sir Alastair Pilkington, and Sir Arthur Knight, former chairman of Courtaulds, who now runs unit seminars.

The fruits will begin appearing in the first of five volumes of the Dictionary of Business Biography, carrying 320,000 words for A-C entries. This is being backed with a £180,000 Social Science Research Council grant.

The unit is also collecting archive material on the growth of twentieth century management, and looking at British multinational banking and investment.

The unit has eight academic staff,

with Professor Hannah and from 1984 Dr Geoffrey Jones, holding tenured posts at the LSE. One undergraduate and one graduate course are run, and nine PhD students are under supervision.

Professor Hannah believes times are changing. A level scores of entrants to business-orientated subjects have shot up, and graduates with good class degrees are looking at business options where once they would have looked to the Civil Service.

He was sure business history would develop beyond the pockets of Manchester, London, homes of the two business schools, and Glasgow University, where Professor Anthony Slaven, took up a personal chair in business history in 1980.

Liaison fund gets go-ahead

by Jon Turney
Science Correspondent

The smaller of two funds to encourage links between higher education and industry recommended by the Advisory Council for Applied Research and Development will receive formal Government approval in the next few weeks. But the go-ahead for a second fund, to reward universities and colleges who win outside contracts, now looks unlikely.

The ACARD report was published at the end of June, and the smaller fund, which the group recommended should be set at £5m a year for five years, has gone ahead rapidly as it was similar to a scheme already being developed by the Department of Trade and Industry.

This fund, intended to support projects which promote academic-indust-

rial collaboration now has a name, Linise, and awaits only a convenient date for announcement. It will be used for schemes like science parks, industrial liaison officers or patent advice in individual institutions.

But DTI officials have some doubts about the second major ACARD recommendation, for a £10m a year fund paying 25p in the pound on top of industrial contracts to universities and colleges. These doubts arise both over the general principle that rewarding the virtuous is a good use of Government money and over the way the scheme could work in practice.

Early calculations show that on present form the three leaders in the field, Cranfield, Salford and Imperial College, London, would take almost all the money in the first year. This is not regarded as much of an incentive to others. Cranfield alone would prob-

ably account for more than half, which might put Sir Henry Chilver, vice-chancellor of the institute and chairman of ACARD in an embarrassing position.

Among the other recommendations, the proposed database recording research expertise relevant to industry is likely to be given a regional trial before any national scheme is tried. This will be in Manchester, which has a suitable collection of higher education institutions.

A full response to the ACARD report is expected in January, and it is possible the announcement of the liaison fund will be delayed until then so the group is seen to get at least half the loaf. But officials are keen to launch the smaller fund as soon as possible.

Learning without limit

A two-year project pioneered by the National Association for the Care and Resettlement of Offenders to continue education for ex-offenders is to be extended to provide a day centre.

The North London Education Project arose out of the need for educational after-care for ex-inmates of Holloway prison which has a large and active education department.

While a growing number of prisoners were receiving some education inside prison, many were unable to continue studies on release because of lack of housing, financial problems and lack of guidance.

The NACRO decided to set up the project in 1981 to bridge the gap between education in prison and outside.

The project goes some way towards providing a model for this kind of continuing education. The only other similar scheme is the education day centre for ex-offenders in Manchester.

MSC prefers to keep college talks on a local level

A dialogue at national level between the Association of Colleges in Further and Higher Education and the Manpower Services Commission has been turned down in favour of regional and local talks.

Mr David Young, chairman of the MSC told the ACFHE conference on the Youth Training Scheme in London last week that he was extremely conscious of the role colleges were playing in developing the scheme.

"But I believe the major differences exist at regional and local level - a fact the Government does not realize - and I think we have to discuss these, taking in employment, the environment and other matters locally, while of course maintaining links with the association," he said.

His reply came in answer to an ACFHE member from Stockport who pointed out that YTS could not work without the active co-operation of the colleges, many of which believed they had been pushed around.

Mr Young said earlier he wished to correct inaccurate reports about the anticipated 20 per cent shortfall on YTS. He did not anticipate this to be more than 10 or 15 per cent at most. Moreover the 200,000 young people currently on YTS already amounted to far more than had been on the Youth Opportunities Programme.

"The main reasons for the shortfall are that youth employment is up and more young people are staying on in further education," he said.

"This undoubtedly will give us problems because employers have responded so well and there are not

going to be enough young people. By Christmas, all 16-year-olds will either be in employment, further education or on the YTS."

"Any extra money resulting from the shortfall would be clawed back by the Treasury but he did not rule out a revision of fees to colleges, at least for 1984."

Mr Young refuted the idea that the private sector was failing to provide quality schemes in comparison to the public sector.

"I accept that both private and public sectors may not be meeting quality and I am not satisfied that we have got it right. I shall not be satisfied until quality is improved. The main problem has been the speed at which the YTS was set up."

Claims by Youthaid that youngsters of YTS will be twice as likely to have serious accidents than other workers, were categorically denied by the Manpower Services Commission this week.

Youthaid says that a survey of YOP showed that the MSC had fiddled the figures so as to indicate that trainees were safer than other workers. The contrary was true and would be translated into YTS unless action was urgently taken.

Mr Paul Lewis, Youthaid's director recommended a live point safety plan that would 'protect' young people: proper inspection of every workplace; improved safety rights and training; proper legal action against offending employers; full investigation of every accident; and better collection of statistics.

Sir Keith fails to please hard-liners

by David Jobbins

Sections of the Conservative party remain deeply disappointed that Sir Keith Joseph, Secretary of State for Education and Science, has failed to convince his Cabinet colleagues over student loans and rejected voluntary student union membership.

He was forced to acknowledge the strength of feeling on voluntary membership during a question and answer session at the party conference in Blackpool.

"I do not see how we can ever make membership voluntary," he replied when asked for a commitment from the Government.

"There was strong support from representatives when Stirling student Mr Michael Freer told Sir Keith: 'I object to being forced to join a student union whose political views are alien to my own.'"

But Sir Keith, clearly on the defensive, cautioned against wrong impressions created by the terminology. "We use the words of industrial trade unionism. In fact the student union is not the same - mercifully - as an industrial union."

Student unions were a mechanism enabling automatic membership of and access to university and polytechnic libraries and sports facilities. But he warned student union officers they would be individually at risk if they acted in breach of charity laws when spending union money.

And he appealed for information on any cases where institutions failed to act when told of instances where Conservative groups were suppressed within student unions.

The allegation had been made by Portsmouth Polytechnic student Mr Jonathan Bullock, who claimed: "In some universities and colleges Conservative students are actually banned from speaking, and holding political activities, by extreme left wing student unions."

Obviously Sir Keith can now do little to further either cause. But moderate leaders of the Federation of Conservative Students fear that his apparent impotence will spur right wingers within the student movement to isolate the FCS from the mainstream of Government thinking.



Sir Keith: on the defensive

Students argue over anthem

Relations between the Protestant and Catholic colleges of education in Belfast have been soured by a dispute between the student unions.

The row dates back to the summer graduation ceremonies at Queens University, which awards the student teacher degrees, when a number of people remained 'sitting' while the National Anthem was played. The incident led to indignant letters in local newspapers and then appeared to die down.

It was resurrected last week when the student union at Stranmillis, the state-owned college, passed a resolution condemning the protest as "petty and hypocritical" and claiming that most of those responsible were graduates of St Mary's and St Joseph's, the Catholic colleges.

In a separate resolution the Stranmillis union decided that joint religious

services with the Catholic colleges were unacceptable and that they should oppose in the strongest terms possible all moves towards joint clubs and societies.

A statement from the union afterwards noted that the union supported the struggle of Stranmillis to maintain its status and identity. The loss of separate sports teams would mean they had lost that struggle, while religious education was a personal matter and should not involve activities organized jointly between the colleges.

But comments to reporters suggested that other factors were involved. The president pointed out that Stranmillis had always been a unionist college; he also admitted that some sports clubs are already seriously threatened by falling enrolments at the college, particularly of male students.

Scottish review urges colleges to trim their sails

There is a "powerful logic" in having only one Scottish nautical education centre instead of the present four, according to a nautical education review.

The review was carried out by a joint working party of officials of the Scottish Education Department and the Convention of Scottish Local Authorities. It echoes proposals from the National Advisory Body that advanced nautical education should cease in six institutions in England.

The Scottish review avoids recommending how nautical education might be achieved, but if the SED and local authorities accept that there should be only one centre, Glasgow College of Nautical Studies is the obvious choice.

It is the largest of the four centres, with almost 900 enrolments in 1981/82. The second largest institution, Leith Nautical College with just under 350 enrolments, is already under threat of transfer to Lothian Regional Council and is likely to become a non-specialist further education college.

Aberdeen Technical College had 150 nautical enrolments in 1981/82 while Kingsway Technical College in Dundee had 36 marine engineering students.

The review stresses that it has concentrated on traditional nautical education and has not considered diversification in the colleges. But it adds that although such developments are important and must be considered in rationalization, they do not affect its conclusions.

No more nautical staff should be appointed, and any proposals for new equipment should be treated with the utmost caution since end-of-recruitment has fallen dramatically, implying *prima facie* underemployment of both, it says. "Even on the most optimistic intake assumptions, the teaching staff needed for cadet courses would be only 43 per cent of present capacity."

Dr Alan Watson, principal of Leith Nautical College, has for some time criticized emphasis being placed on cadet options, saying: "The future

lies in the broader field of maritime education, embracing the offshore industries."

He has argued that Leith needs more staff to cope with an increased student intake, for while there has been a fall in cadet courses, there has been increased demand from abroad.

However, the review rejects this argument saying that although the number of overseas students in Scottish colleges is "not insubstantial" there is extremely limited scope for expansion. "An opposite trend is already in evidence, with overseas countries setting up their own nautical colleges."

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Overseas news

Chaos at start of academic year

from Bernard Kennedy

ANKARA
The Turkish academic year is getting under way amid the usual confusion, and just a touch of political controversy.

Although term has started officially at most universities, many courses have yet to begin in practice, while thousands of students are still in the dark as to whether they will be allowed to continue their studies.

Meanwhile, Professor Sakir Akca, rector of Ankara's Gazi University, has been accused of making illicit appointments and illegally sacking some 200 lecturers.

Perhaps the main cause of confusion is the powerful Higher Education Council's directive on examinations, which sets down the conditions under which a student may proceed to his or her next year of study. The directive is being interpreted in various ways, most severely at Istanbul Technical University, where hundreds of students are claiming that their studies have been terminated without sufficient reason.

In contrast, innumerable young peo-

ple who for one reason or another, willingly or otherwise, have left higher education without completing their studies over the last six years are now hoping that they will be allowed to return to college this year under a recent "amnesty". Much depends on how individual universities decide to apply the terms of the amnesty.

As for Professor Akca, he has been refusing to discuss allegations that he has given administrative posts to old right-wing colleagues without consulting the faculties concerned, but there is no sign of any action being taken against him, either on this issue or that of the "sacked" academics.

The 200 were not actually dismissed, but declared surplus to requirements and turned over to the Education Ministry at the end of the 1982/83 academic year. Subsequently, however, the ruling National Security Council approved legislation forcing that the 200, together with staff from other universities caught in the same position, should be given their jobs back, since their dismissals were unjustified and their skills needed. Professor Akca seems to be ignoring this legislation.

Career expectations threat to teacher recruitment

from Charlotte Beyers

PALO ALTO

More American students today place greater value on a career than on marriage and a family. University of California at Davis researcher Mary Regan asked graduating seniors from the classes of 1970 and 1980 their most important expectation from a college education. In 1970 26 per cent replied career knowledge, compared with 43 per cent in 1980. Seventeen per cent said marriage and family in 1970 while 10 years later the number was only 2 per cent.

Mary Regan says today women are very concerned about jobs and career first and family second. "They may not know how they are going to handle all this or what the stakes are. But they are interested in the financial benefits, career success and in the chance for prestige."

The social scientist thinks this has serious implications for elementary and secondary schools who used to find their best teachers within the ranks of the bright women who did not want a professional career.

"These women are now dead earnest about entering professions and are

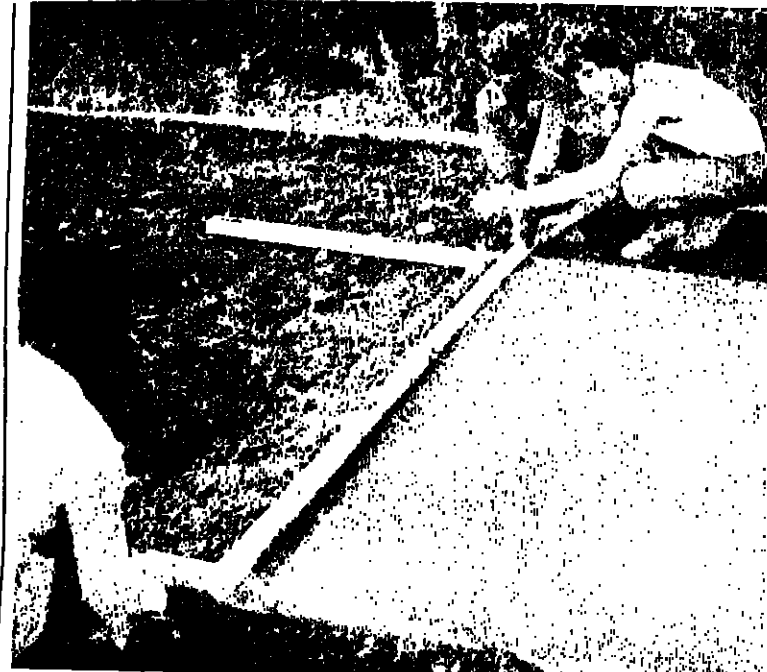
moving into many areas that have been typically male dominated," Ms Regan added.

In her survey she collected detailed information on the career goals, family and economic background, academic interests and personality traits of 6,352 students entering UC Davis as freshmen between 1963 and 1966. She gathered the same data from 9,078 students who started their university studies in the years 1976/1979.

She also followed 1,700 of the students who began college in the 1960s over a 10-year period and polled them again in their senior year. She then gave them the same questionnaire and psychological tests as alumni 10 years later.

Contemporary students appear to have a strong interest in general education and in applied knowledge, she noted. At the same time, they are specializing more, with a bent towards the professions and the applied biological sciences.

She reports that today's students are less spontaneous, more serious, less impulsive, and less likely to question authority than their counterparts of 20 years ago. She also characterizes them as more religious, better organized and somewhat less creative.



Scientists alienated by words

from Geoff Maslen

MELBOURNE

The language science teachers use in their classrooms is turning students away from these subjects and preventing them from qualifying for technical jobs. That is the conclusion of Professor Jay Lemke, from the City University of New York, who recently completed a tour of Australian universities.

Professor Lemke says the classroom language of biology, chemistry and physics is often highly impersonal and dogmatic - and alienating. "It does not show science as an activity done every day by real people working together," he says. "It creates an image of science as something people cannot understand, couldn't imagine themselves working at, something best left to the 'experts'."

As a result, he says, the image science presents attracts some sort of students, while alienating girls, students from less well-off homes, or those from backgrounds where formal languages are then kept from participating in scientific and technical activities and from a share in the social power that goes with them.

Teachers do not set out to turn students off science, Professor Lemke says. They simply use patterns of speech typical of scientific writing and which they learned in their own university training. Yet in a three-year investigation in America, Professor Lemke says he found that students use three or four times more likely to pay close attention when teachers do break away from the "official" language of science. Unfortunately, they also signal that these breaks do not belong to the serious business of the lesson and are not really scientific.

"The formal language of science also uses special linguistic strategies to show how concepts are related to each other. When we are frustrated at not being able to make sense of this kind of scientific (or legal or bureaucratic) language we are encouraged to blame ourselves, rather than the language," Lemke says. "So it is not just a distorted image of science that is projected by these forms of language, but an image of ourselves as incapable of understanding and using science."

Lemke says that a fair go for all at success in science means that teachers must be helped to find a language of science for the classroom that bridges the gap between the languages the students already understand and the language most useful for doing scientific work, and presents science as the very human activity that it is.

Firm grounding: Namibian refugees in Kenya receive lessons in laying a concrete floor from an Intermediate Technology Workshop technician.

The first group of nine students, from Uganda, Lesotho and Kenya, all supported by the British Council, has already started learning the theory and practice of building and construction.

Cross-border standard considered by the East

Plans to standardize higher education in all the countries of the Soviet block were discussed at a ministers' meeting this week in a small town in Poland.

The ministers met in Mragowo, in Olstyn province, and were presented with long-term proposals which would include the smaller, developing nations such as Vietnam and Mongolia.

The conference also debated the adaptation of university research in science and technology to the five-year plans of the countries, and the "current problems of perfecting the contents, forms and methods of communist upbringing in higher education."

On both of these points, a report from the Polish ministry of science, higher education and technology dealt with the last five years experience in Poland. In fact, the scientific system of classifying scientific research projects introduced in 1973 quickly re-

duced Polish academic research to an unseemingly scramble for high ratings and priority in funding, and led to much wastage of time, effort and resources, since individual research projects were divided among widely separated universities and institutes.

As for communist "upbringing", the experience of the Solidarity era revealed that Polish students were anxious for an alternative world view and outlook to be incorporated into university life.

Another feature of the conference was the presence of a delegation from North Korea. This country had also been represented at the meeting, took place in Budapest a few days previously. This has raised some speculation that North Korea may be seeking closer academic and educational ties with countries of the Com-econ block.

Warning for campus spies

Any campus activities of Canada's proposed new intelligence service must be strictly controlled to ensure freedom of expression and discussion, the Canadian Association of University Teachers has told a parliamentary commission studying a Bill to create a new civilian spy agency. The Bill has since returned to the Government for redrafting.

The association reminded senators that universities were "special places where guarantees of freedom of expression should be explicitly made". It added that members of the new security force taking university courses should not report on comments made by academics or students.

Our Eastern European correspondent looks at the background to the trial of the Russian academic Iosif Begun

The trial of the Russian academic Iosif Begun has focused attention once again on the cultural plight of Soviet Jews. With less than 150 emigration permits per month (there were several thousand years of the early 1970s), there is little hope of being able to leave for the Soviet Union's 1.8 million Jews.

Yet the entry in their internal passports - "Nationality: Jewish" - results in a number of educational and professional disadvantages. In particular, Jewish school-leavers find it difficult to enrol in a good university for mathematics or physics. Postulants for the degree of candidate of sciences (PhD) face a sterner questioning in the defence of their thesis and promotion and prestigious appointments go consistently to non-Jewish colleagues.

If, in despair, Jews apply for emigration they are routinely dismissed from professional employment, even if the application is subsequently rejected. Under the pressure of these disabilities, an increasing number of Soviet Jews, have begun, quietly, to study

Cultural revolution on the quiet

their ancestral culture. The psychological rationale appears to be that, since the authorities insist that one possesses some mysterious, and unwelcome attribute called Jewishness, one might as well find out what it is.

But Jewish culture, too, is denied - except in the Jewish "homeland" of Birobidjan - a paper creation of the 1920s on the Chinese frontier - which has never managed to attract more than a tiny proportion of the Soviet Jewish population.

Apart from Birobidjan, and a few token Jewish theatrical and folklore groups performing in Yiddish, Jewish culture is not available to the average Soviet Jew.

During the 1970s, therefore, unofficial seminars in Jewish culture and the Hebrew language grew up in Moscow, Leningrad and other cities. Publicly, the Hebrew language was attacked as "reactionary", teachers of Hebrew who gave private lessons were not

allowed to pay income tax on their earnings (lest this be interpreted as recognition), and when one enterprising group tried to register their activities under the guise of a social club, the request was turned down on bureaucratic grounds - there was no properly trained "club-leader", no budget, no available premises.

In recent years, the same kind of approach has been taken with the teaching of Hebrew - the volunteer teachers cannot be recognized as they have no proper diplomas. True, but since Hebrew is taught in the Soviet Union only to very specialized groups in Institutes of Oriental Languages (to which Jews find it impossible to gain admission), there is effectively no way in which they can obtain a diploma.

Iosif Begun, who was put on trial last week under article 70 of the Soviet penal code accused of "systematically producing, spreading and transferring abroad deliberately slanderous information about life in the Soviet

Union", was prominent in the Jewish cultural revival. By training a radio-electronics engineer, who for a time was a lecturer in the mathematics department of the Moscow Institute of Agricultural Production, he was dismissed from professional employment in 1972, after applying to emigrate to Israel.

Since then he has found it impossible to remain even in an unskilled job for any length of time, has been hounded by the authorities, and has already served two sentences of Siberian exile for "parasitism" (being without visible means of support).

In fact, he had been scraping an existence by giving private lessons in mathematics and physics. Later, having taught himself Hebrew, he began giving lessons in that also - an activity which he had continued in spite of frequent official warnings.

As a scientist, Begun has been associated for many years with the clandestine "Sunday seminars" for re-

franks - scientists who have lost their jobs after applying to emigrate. The authorities have been trying to close down these seminars since the first one was organized 10 years ago - and have recently begun a new press campaign against them.

As a teacher of Hebrew he is at the heart of the Jewish revival movement which cuts clean across the new Andropov policy (a revival from Khrushchev's time) that the nationalities and national cultures of the Soviet Union should "merge".

Moreover, he has been unwilling to hear persecution and repression quietly - and the "deliberately slanderous information" he has allegedly transmitted abroad is simply the details of the authorities' campaign against him.

For these activities, he can claim two doubtful distinctions - he is the first Soviet Jewish activist to be put on trial three times for what is, in essence, the same offence - and, so far as is known, the first who has alarmed the authorities so much that they would not bring him to trial in even a "closed" court room but instead organized his hearing within the prison itself.

Universities face student shortage

from Barbara von Ow

MUNICH

There will not be enough students at West German universities from the mid-1990s due to a dramatic slump in the birth-rate, and new universities will bear the brunt of the problem, according to a government study published this month.

The study, presented by federal education minister Dorothee Wilms, calls for a redistribution of students within the next 15 years to ensure that sufficient numbers go to new universities.

A series of new universities have been founded in West Germany since 1960 to ease the pressure on the older institutions in the view of a swelling number of students. There are now 32 new universities among the country's 60 universities. No more are planned.

According to the study, a quarter of the 900,000 German students chose to go to universities last year. In 1978 it was only a fifth. About 56 per cent of the total increase in students during the 1970s was due to new universities. This meant that the traditional universities grew "only" by 76 per cent instead of 132 per cent during the past decade. However, in 1979 the capacity of new universities was only filled by 92 per cent, while the figure for old

universities still stood at 138 per cent. But last year, new universities were filled by 130 per cent and traditional ones by 160 per cent. As some modern universities are only just starting to operate, this trend will continue throughout the 1980s, the report noted.

But in the mid 1990s, the capacity of at least half the new universities will slump back to the level of 1978, the study warns. Most threatened are peripheral universities in thinly populated areas, such as Konstanz, Bayreuth, Bamberg, Trier and Kaiserslautern, which will have to recruit over 50 per cent of their students from other regions. Like all new universities, they must develop modern advertising techniques to attract young people to their courses.

The main handicap of new universities is their limited range of subjects, it notes. At 19 of the old universities, 80 per cent of all subjects are available. At new ones this is mostly "considerably less", it said but gave no details. However, a recent poll among students showed that for three quarters the option between a traditional or a new university was not decisive. Among advantages listed for modern universities were that they offered innovative courses and were smaller.

Bombay in bid to stop introduction of law course

from A.S. Abraham

BOMBAY

The legal and academic establishment in Bombay is making a determined bid to stop the introduction of a new five-year and full-time law course drawn up by the Bar Council of India (BCI).

The Bar Council of Maharashtra, affiliated to the BCI, Bombay University's board of law studies and principals of law colleges affiliated to Bombay University have opposed the new course in letters written to the BCI. An advocate has also challenged it in the Bombay high court.

The course, which the BCI wants law colleges throughout the country to adopt, envisages full-time day colleges in buildings used exclusively for the purpose. Instruction must extend over at least 5½ hours a day, at least half the teaching staff should be full-time, and the teacher-student ratio should be at least 1:40.

Those opposing the course say that it will restrict legal education to a few rich and mean the winding up of most law colleges because these are part-time morning and evening institutions.

Cuban academic detained

A prominent Cuban academic is reported to have been arrested in Havana in spite of official promises of a safe passage to France.

The former vice-rector of the human sciences faculty at the University of Havana, Ricardo Bofill, sought asylum in the French embassy in April, but left after receiving assurances that he was free to emigrate to France. At the end of last month he was reported to have been arrested. Senior Bofill Castro, an outspoken critic of Fidel



Keeping up the style

from P.B. Burke

OKLAHOMA CITY

A university computer has been programmed to assess the styles of writing of English language students. Its criteria are the styles of twentieth century essays - or at least the 1,000-word samples of their essays which have been fed into the computer.

This is claimed to be the first example of a computer being designed to assess style as opposed to facts. It is called "Quintillian Analysis".

"It was designed with the thought that college students could type in their compositions - such as a 500-word 'theme' - and the computer would produce a commentary," said Dr Winston Smith Weathers, English professor.

"The computer counts words, checks sentence length, looks for redundant words, searches for structural and stylistic clues, such as clauses and punctuation, and comes up with an assessment."

Tests on the style of established American writers seem to show that the computer is "punctuation happy".

Analysing the Nobel Prize acceptance speech of William Faulkner, the computer proclaimed: "Your minimal use of internal punctuation is typical of popular journalism or other rapidly paced styles."

On a piece by E. B. White the computer opined: "Your use of internal punctuation is typical of essay writing and serious writing in general... You guide your reader through syntax, but do not overwhelm him with punctuation signs." Meanwhile, Hemingway's style is lumped as "popular journalism".

"The computer can make up to 100 objective comments. 'It is meant to serve as a kind of third reader for both teacher and student,'" said Dr Weathers.

US debate grows over the role of computers

from E. Patrick McQuaid

CAMBRIDGE

In the wake of several reports from government and industry critical of maths and science instruction in America, the last few weeks have seen considerable debate over the role computers and other new technologies should play in schools.

Just days after the secretary of education said he would like to see the United States commit itself to a massive computer research and development effort, the National Education Association warned Congress not to allow American teachers and students to become the "guinea pigs" of industry.

While the 1.7 million-member group, a collective bargaining and professional association, is prepared to endorse the Computer Literacy Act of 1983 (which would provide local grants for planning, curriculum development, teacher training and computer acquisition) the NEA has "misgivings" about other legislation.

Also before Congress are Bills that would allow hefty tax write-offs to firms donating technological equipment to schools and colleges. But, says the NEA, these computers do not carry the same guarantees and warranties, manuals and ancillary materials, or the same service agreements as equipment purchased outright.

Meanwhile, the congressional representative from Silicon Valley, a district in California hosting 700 high tech firms, says government should help foster conditions favouring innovation but should stay clear of direct participation in the high technology industry. Mr Ed Zschau, who chairs the republican task force on high technology initiatives and is a former business school lecturer

from Stanford University, said Congress should avoid direct involvement in industrial development.

He believes that a proposed technology planning board to identify and subsidize promising industries would be doomed to failure. Bureaucrats in Washington, he noted, "are not the right people to distinguish between opportunities and dead ends."

Bank Street College of Education, in New York City, is calling foul play against the government's National Institute of Education over its award of \$7.6m to Harvard University to establish a school technology centre. Bank Street, which said it could do the job for \$3m less than Harvard, was passed over on the basis of the "comprehensiveness" of Harvard's proposal, said the government.

The president of Bank Street, Mr Richard Ruopp, said his office would review government documents before deciding whether to pursue the complaint further.

The five-year contract was announced by the education secretary, Mr Terrell Bell. He said the centre will be a focus for research on how to use computers and other education technology to improve science, maths and computer instruction. It will be established at Harvard in cooperation with a consortium of educational organizations and the public (state) schools in Cambridge and neighbouring communities.

Legislation creating the competitive contract came last year when Representative Silvio Conte, a Massachusetts Republican, inserted language in a stopgap funding bill that called for the National Institute to establish a laboratory somewhere in the north east United States.

THES PEER REVIEW

The THES has undertaken two surveys to discover how academics in eight disciplines regard the standing of their subjects. The results, giving both teaching and research ranking in architecture, chemistry, civil engineering, economics, French, history, physics and politics, were published in the THES of 3.12.82 and 5.8.83. The two reports are now available in one six-page reprint (four pages of editorial matter) price 80p.

Inquiries should be addressed to:
Frances Goddard, THES Peer Review
The Times Supplement
Priory House, St John's Lane, London EC1M 4BX.

The price includes postage and packing within the UK but not Red Star or hand delivery.

From black magic and biblical history to the law court

Some time ago a literary supplement ran a piece on black magic illustrated with a series of illuminated manuscripts provided by Mr Ephraim Isaac, now a visiting professor at Princeton University.

Mr Isaac is perhaps better known in biblical circles. This year, Doubleday, in conjunction with Duke University, will release *The Book of Enoch*, a new translation from the oldest known manuscript, and the *Journal of the American Oriental Society* will carry his article, "New Light Upon The Book of Enoch from Newly-found Ethiopic Manuscripts".

Elsewhere, Mr Isaac is at work on an even larger edition of *The Book of Enoch*, a history of the Ethiopian orthodox church, a multi-volume epitome of classical Ethiopic literature in English translation, a textual study of Tezeze Sahnet, a Palastine homily on the Sabbath, and two comprehensive studies on the origin and development of the classical Ethiopic script and major literary forms.

And there's more. But Mr Isaac will make headlines this year, as he has in the past, because of manuscripts he has filed with the federal courts in Boston, where he has charged Harvard University with racial and national origin discrimination.

With his long grey-streaked beard and spectacles, Mr Isaac is the very

E. Patrick McQuaid describes an unusual discrimination suit

Image of a scholar who holds degrees in philosophy, music and chemistry, attended Harvard Divinity School and earned a PhD at Harvard in near-eastern languages and civilization. In addition to classical Ethiopic (Ge'ez), he has mastered Hebrew, Greek, (Coptic), Biblical and modern Hebrew, Aramaic, Syriac, Sabaitan (South Arabic), Classical Arabic, Greek, Latin, French, German, Italian, Dutch, "rudimentary Russian, and Chinese" and, of course, English. For all that, though, many of the remarks he made, during a recent interview, were interpreted by his lawyer and other advocates who have taken up his cause.

After completing his doctorate in 1969, Mr Isaac, an Ethiopian, remained at Harvard and was instrumental in the efforts to establish a department of Afro-American studies. He was nominated for tenure and despite the enthusiastic recommendations of his colleagues was denied that appointment in 1975.

Mr Isaac never questioned my capabilities. He said, "Harvard's position was that my field of specialization was no longer relevant to Afro-American studies." Harvard has a great deal of money, but it is not only to be used, but to be

The federal Equal Employment Opportunity Commission agreed and reasonable cause to find that Harvard engaged in unlawful practices of discrimination on the basis of race. Discrimination included these remarks and within a few months Mr Isaac was issued a right to sue notice.

The civil rights authorities had determined that Harvard had effectively excluded Mr Isaac from serious consideration when the tenure committee was instructed to select only two of three candidates and to award promotion only to joint appointments. The other candidates had been recommended for tenure appointments in more than one department while Mr Isaac sought permanent appointment only to the Afro-American studies department.

After hearing from witnesses, the committee had a preference for black Americans rather than blacks of other national origins. Nor did Mr Isaac have the availability for promotion from the non-tenured to the tenured teaching staff.

Mr Isaac and his supporters view his development of black studies in America as a triumph. Mr Melvin Honig, president of the regional chapter of the National Council for Black Studies, said: "The precedence that Harvard has established in respect to Afro-American studies is a negative one." He cites early attempts by Harvard not to grant Afro-American studies full departmental status.

There is still considerable debate at Harvard among students and professors, both black and white, over the

PICKUP ready for taking up

The Department of Education and Science's professional, industrial and commercial updating programme (PICKUP) is now almost fully operational. Most of the nine full-time regional development agents have been appointed, the seminars for local authorities and workshops for colleges, polytechnics and universities are under way and the timetable is being met.

The Herculean task confronting the programme – to stimulate nationally the updating role of education – arose out of the 1981 consultative document *Continuing Education: Post-experience vocational provision for those in employment*. The proposal put forward in that paper was for a strategy to speed up the expansion of mid-career vocational courses for those people in work. "This can yield practical solutions capable of rapid implementation and need not prejudice any long-term and more general development across the whole field of continuing education which might be provided in the light of the advice from the Advisory Council for Adult and Continuing Education."

The emphasis was on those already in employment rather than towards groups such as the unemployed, women and ethnic minorities who might have difficulty finding work in the first place and it was oriented largely towards the employer since it was the intention that the cost of the expansion was to be met from the employer's purse.

It was the self-financing aspect of the proposals which gathered the most influential criticism. Most employers did not consider it their duty to carry the burden of in-service training at the best of times when, as they saw it, retrained employees just seemed to pick up their stumps and move to a more lucrative job once they had acquired extra skills or qualifications.

And institutions like Newcastle Polytechnic warned that in a period of economic recession even fewer firms were prepared to invest in training and day release opportunities were drastically reduced.

The National Association of Teachers in Further and Higher Education went further, questioning whether the political will was wholeheartedly behind continuing education for adults when local authority services were being squeezed to the point of decimation and part-time

Felicity Jones looks at the promotion of updating education

provision in terms of weighting was so heavily penalized.

On the whole, the education world recognized that the DES had identified some necessary, rather than all the conditions for making adequate post-experience vocational provision for those in employment.

Yet at meetings up and down the country the same criticisms are being put to the PICKUP team. At a recent conference on educational guidance services, a DES representative was unable to counteract the objection that PICKUP had "failed to grasp the nettle" of enabling small businesses to release employees because there was no subsidy or tax relief for companies and no paid educational leave for the employees. Colleges were also being expected to develop new areas of work, a costly pump-priming exercise, with little additional resources while adding to the already over-burdened commitments of lecturers, said the critic to murmurs of support.

But within these severe limitations there are aspects which perhaps do deserve closer attention not least because it has become apparent that in some regions the Manpower Services Commission is looking at PICKUP as a model for its local initiative-orientated adult training strategy. The disparity in the scale of resources between the two becomes apparent when it is remembered that PICKUP has only nine local agents compared to the MSC's 50 or so. The MSC also has the considerable established resources of its job and skillcentres to draw upon.

The PICKUP programme received £2m in its first year out of which £1m has been given to the Open University to develop distance learning with the aim eventually of being self-financing. The remaining funding is being used to set up the infrastructure, to promote curriculum development and to set up information networks. None of the money, however, is being used to

subsidize the courses themselves.

The department likes to see the programme acting as a "catalyst" (a buzzword also in current use by the MSC) stimulating the expansion of updating courses and encouraging co-operation between institutions and employers. The framework is provided by the nine regional agents, most of whom have now been appointed from industry and education who are the go-betweens at the regional level and the essential cogs in the mechanism.

And they have their work cut out for them in trying to cover large chunks of the country without the benefit of any support staff. David Thomas, who was appointed as agent for London and Thames Valley a few weeks ago from his post as dean of the architecture, planning and estate management faculty at Oxford Polytechnic, is aiming to motivate five universities, eight polytechnics and 90 colleges largely singlehanded.

Stamina and the gentle art of persuasion are the indispensable tools of these men (no women have been appointed yet) as Peter Wilson in the West Midlands region can testify. He works in both the chocolate and tyre manufacturing industries before becoming a principal lecturer in management studies and thence on to PICKUP.

He exudes the barefaced enthusiasm of a true salesman and would not be offended by that description. To him PICKUP is essentially a question of successful marketing. It is his view that the interests of the colleges and industry are not so different but, rather like recalcitrant schoolchildren, all they need is a little helping hand to enable them to see their mutual interdependence. "Colleges on the one hand say they are not interested while the companies say 'They never seem to have what we want'. When what is needed is to open up the channels of communication," he said.

There are, he admits, a number of barriers, real or otherwise, to this sort of mid-career course development: the lack of money to advertise, the need to maintain staff/student ratios, and timetable problems but nevertheless his motto would be "nothing is impossible", though the parties involved might and do take a slightly more jaundiced view about the realities. Another motto he employs is "have



Dr Will Bridge, national coordinator of PICKUP agents

PICKUP will travel" and travel he does from one end of the country to another to conferences to put up stands and visiting see colleges in one day are nothing exceptional.

One very common complaint is that conscientious as they are, the agents are hardly ever available especially when they are needed for immediate queries over the telephone. In the West Midlands, however, there is a more comprehensive network than elsewhere in the country. A consortium of five institutions being launched officially at the end of this month will provide a simple, single face to companies so that an employer with a training need can be directed to the institution and department with the most expertise to offer. Warwick University, the polytechnic and three colleges in Coventry are cooperating but without the DES developing grant and generous funding from the local authority one wonders whether such cooperation would be possible.

The agents also carry forward the impetus gained from both the regional workshops and local authority seminars. The 1980 consultative document notes of financial incentives for the local authorities look at ways in which they could facilitate PICKUP through fee retention for the college, net budgeting, the accumulation of points on the salary scale as an incentive for lecturers and more flexible staff conditions and timetables.

Dr Will Bridge has been appointed by the Further Education Unit, which



Mr Peter Wilson, West Midlands true salesman

is sponsoring some of the projects new approaches to curriculum development, as the national coordinator of the team of regional agents.

Dr Bridge was the deputy director, Southtek, the Open Tech project based at Brighton Polytechnic. He was responsible for setting up a work of study centres and support facilities to develop packages in the new technology technicians.

The other main strands in the PICKUP programme include the computerized directory on updating courses being developed over two years, £250,000 from the DES by Gull Educational Services, the company which has been set up by Colin Ham, a former assistant secretary at DES. And a manual of good practice being compiled by the western regional management team at Bristol Polytechnic should be available by the beginning of next year.

PICKUP is laying the foundation for some useful interaction among some parts of the country and among institutions initiatives had been taken and it is right to praise that PICKUP did not invent a wheel.

But without more substantial funding, paid educational leave and incentives for employers, it cannot claim credit for being anything more than the germ of a good idea or a good sales promotion. What is needed now is a hard cash injection round to make it something more than a well-meaning pilot project.

Ngaio Crequer talks to the new chairman of the Committee of Vice Chancellors and Principals

Setting a steady course

There are a lot of people who do not like Lord Flowers, the new chairman of the Committee of Vice Chancellors and Principals, and some of them are vice chancellors. They think he is arrogant, has a patrician air, is a bully even, but chiefly they don't like him because he makes them feel ill at ease.

Some vice chancellors were against his appointment to the CVCP chair. In fact he will be the first chairman in recent history who has the calibre and the intent to make the committee, and therefore the universities, a force to be reckoned with once again.

The only other person who made an impression was Sir Alec Merrison, of Bristol University, who by force of personality and of circumstances – his reign was during the 1981 cuts – made a public issue of the universities and what was happening to them.

The 1981 cuts have been followed by the 1983 siege and the battle is probably a greater one, though it is less obvious and less public.

This year the universities are being asked by Sir Keith Joseph, the Secretary of State for Education, through the University Grants Committee, to elect willingly to become different kinds of institutions. He has posed the questions and wants not just answers but examples of good behaviour.

In the last few months the universities have been put into a "catch-22" situation on student numbers. They cried out for more when the UGC targets were rigidly set. Ministers understood and agreed when they, and parents and constituents, complained of the inequity of denying places to this year's crop of good candidates.

A well-orchestrated battle was fought in Whitehall corridors to get the

UGC to relax its targets, and this resulted in a Government invitation to the universities to take more students, but without more money.

The universities, which had spoken up for the disadvantaged students and their disadvantaged grants) had therefore to say "yes", they would take them, even though it might mean a worsening in quality for those who would come afterwards.

Brian Hilton Flowers, rector of Imperial College, London, will lead the universities through a period which, though difficult now, is more important for the implications it will raise for future years.

He is actually none of the things he is accused of. If he makes people feel ill at ease, even vice chancellors who like to do that to other people, it is because of his commanding knowledge and experience, rather than his approach.

The son of the Rev. Harold Flowers (*Who's Who* does not mention his mother) he went to grammar school in Swansea and to Cambridge University as an exhibitioner.

He shone very early and researched into nuclear physics and atomic energy at Harwell. He has headed or been a member of most important science bodies, including chaired the Science Research Council from 1967-73 and was a president of the European Science Foundation. He has made a particular name in environmental, energy and pollution issues.

His name frequently appeared in *The Times* when he chaired the London University inquiry into medical and dental education. As a member of the House of Lords, Lord Flowers is a contributor to education debates and

lately he has taken a more serious interest in politics. He was a founder member of the Social Democratic Party in 1981. He was made a fellow of the Royal Society in 1961. Now 59, he has been rector of Imperial College since 1973.

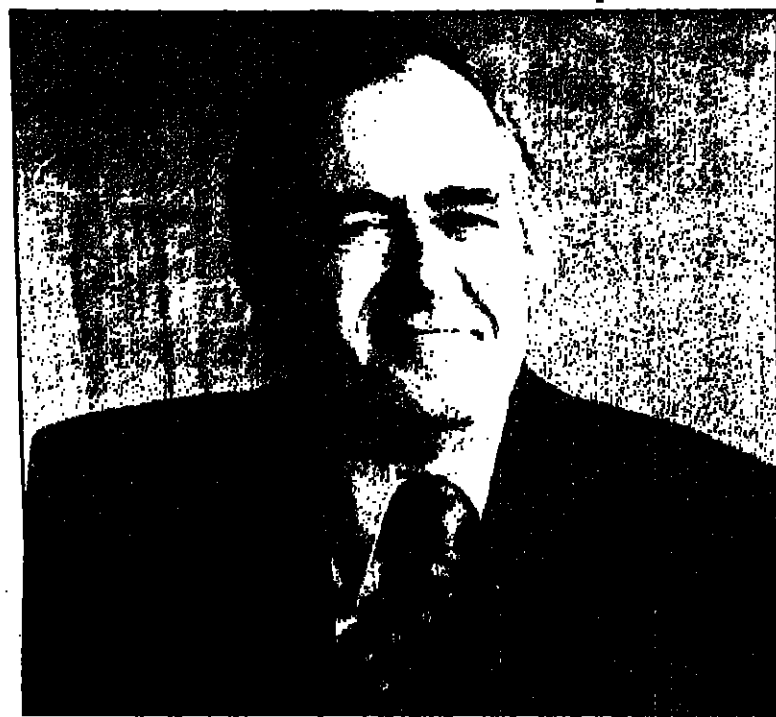
Lord Flowers is shy and a bit of a loner, but surprisingly egalitarian, although he can be dismissive in a charming sort of way, of inferior intellects. His single-mindedness and determination are often misread, sometimes deliberately, for vengeance.

On the new numbers game, Flowers is acutely aware of the dangers. But he poses three questions: "Do we do the students any good by taking more? Do we do ourselves (the universities) any good by taking more? Do we do the polytechnics any good by taking more?"

On the latter, he says that if the higher education system takes another 6,000 students per annum for two years and none of these is taken by the polytechnics, then 6,000 of the best polytechnic students will be transferred to the universities, and another 6,000 who would otherwise not have got places will go to the polytechnics.

"It is not quite as bad as that because some people, rightly prefer the polys, but there will be an element of this. So it will not do the polytechnics any good," he said. "It will do the universities any harm because it will set the best of poly people then we would not be lowering our standards."

Nor will it do the students any harm because of the nature of the universities' reply. They will only take students where they can be fitted in relatively



Lord Flowers: a force to be reckoned with

easily, where the staffing and buildings already exist.

He accepts that it might do the universities harm because in a few years' time, when numbers are swollen and the end of the "bulge" is in sight, the Government of the day may say: "Well you managed on that kind of expenditure per student then so..."

But as Lord Flowers points out, between now and 1995 there will be two elections. "If we were doing something that would lead to a sharp deterioration (in the unit of resource) then I am not sure I would have agreed to it. In the meantime we have all of these kids... We cannot just say it is the Government's problem, so we have said 'yes', we will try. If we are wrong it means we are wrong, then about the attitude of ministers."

Flowers is aware that for some time the universities have been on the defensive. Like many SDP supporters he dates their difficulties back to the days when they ignored, most discourteously, Shirley Williams's 13 points. "The universities unwisely dismissed all that, as having no substance. That gave us a bad name. We will not do that again but I think ministers have thought that we would and have tended to be rather sharp in the way things are put. If questions are not answered they put statements," he said.

So he is going to try to make the CVCP less purely reactive and more proactive. He is also taking on board some of the recent, public criticisms of universities in the Leverhulme study and elsewhere.

Two short term study groups are being set up, for example to look at external funding and quality control. The groups will report and then go out of existence. But they will not just involve vice chancellors – others will be invited to sit on them.

Here too is perhaps recognition that many senior people in the universities are beginning to resent being dispossessed. Talk of forming a new group, say the British Universities Association, which would represent not just vice chancellors but registrars, secretaries and so on, has grown in recent months.

The first study group will see if there are other ways of finding core funding for the universities, other than the public purse. But this is not just another look at how to "top" industry for a bit more research income. Lord Flowers is thinking big, thinking of ways of attracting more than £100m to universities funds. "This kind of message has not been given yet, so no one has seriously thought about it. I am talking about the contribution of huge funds to pay for the maintenance of buildings," he said.

He wants at least a change in the tax system and one possibility, the group may examine, is some "acceptable" loan system, which does not fall on the parents, does not create a negative dowry effect, but would be payable through a student's own taxes.

The other study wants to see how the universities can guarantee the standards of their own teaching. "I believe there comes a point somewhere between primary school and election to the Royal Society where accreditation must be able to peer review among equals," he said.

But where is that point? "In the CVCP we are interested in seeing whether we can do something to improve self-accreditation. Is the external examining system sufficient, consistently applied and taken seriously?"

"We all know places where it is taken extremely seriously, and others where it is a laughing stock," he added. "So the least we can do is offer guidelines as to how the external examining system can be improved in future, or we may do more."

But Lord Flowers rejects the notion that by setting up these two studies he may be nipping in the bud any external controls that may be considered by Sir Keith or others. "We are doing it because we accept the validity of the criticism made in both cases, that university is more expensive than the taxpayer can afford, and the way we monitor our courses is not totally acceptable, but please allow us to solve this ourselves," he said.

He says there is now a willingness to change among vice chancellors. "Twenty years ago every university insisted it was equal. Ten years ago the universities demanded the right to become equal, now the emphasis is on the right to be different... so diversity can be a good, not a danger."

But he adds an important caveat "providing it is a dynamic system and there are no labels, and that there is a right to change. Universities are biological objects and they do change."

He thinks this recognition of diversity will also help the CVCP get round its problem of never being able to speak with a strong voice for the universities nationally and able only to offer "flabby statements" because vice chancellors rarely agree.

He thinks that now the committee may see diversity as a virtue and feel no need to paper over any differences, but say readily it will do things differently. Because of this diversity he expects overlapping between the universities and polytechnics. "Some departments of some polytechnics do more research than some departments of some universities."

He says the chief difference between the two in the past has been the method of financing them, although there have been historical differences too, with different kinds of staff.

He would like to see a much more relaxed attitude across the spectrum, not judging institutions as to which is better than another, but enjoying the differences.

As for the new phase the universities are in – waiting for the UGC letter which will plot the strategy for Sir Keith's fundamental reforms – he is not downhearted. The 1981 cuts were managed, after all, in an orderly way, even by those very badly hit, and the universities have that experience behind them.

"It is a little wary of ministers (not Sir Keith) who think there are miraculous ways of finding vast sums to save in the universities. But he says the universities can always continue to seek greater efficiency."

"When I ran the SRC and when I came here it was standard technique to say I want three separate programmes: what happens if we carry on as now, if we have an x cut, and if the cuts are applied faster. It is standard management advice and absolutely legitimate," he said.

Karen Gold profiles John Stoddart, new principal of Sheffield Polytechnic

Sheffield steels itself for a Big Fish



John Stoddart: "a low profile with a hard edge underneath"

A trace of Merseyside slips into John Stoddart's conversation from time to time: maverick vowels which slightly undercut the purposeful exterior of the new principal of Sheffield Polytechnic.

Mr Stoddart has had a purposeful career. Leaving Reading University with a degree in political science, he moved out of school teaching after two years, through swift promotion at Enfield College of Technology – later Middlesex Polytechnic – a senior posts at Sheffield and North East London Polytechnics until in 1976 he went to Humberside to build a regional higher education institute from six colleges.

Last month he officially started work at Sheffield, the country's youngest polytechnic director at the age of 44.

Each time he moved it was to another growing institution. When he arrived in Hull, it had some teacher training, non-advanced work and two degrees, validated by the Council for National Academic Awards. When he left there was "about 20" and Humberside council had applied to the Government with some confidence for their college to be given polytechnic status.

Councillor Maxwell Bird, chairman of Humberside's education committee, recalls that at the time of Mr Stoddart's appointment Humberside had virtually no higher education, and "wanted someone who came from a world that we really didn't know, and who would make the breakthrough and bring us into the world of higher education proper."

"I'm sure John Stoddart understood the job he came to do better than anybody who appointed him."

Nevertheless his arrival was not auspicious, coming at a time of a local authority-ordered merger of two colleges of education, a nautical college and art college, and a college of technology. (The region has a tradition of education independence when last year the council brought Grimsby

Colleges into Humberside, a local paper warned that innocent and helpless Grimsby was threatened by a "Big Fish"). In 1976, one of the constituent colleges refused to recognize the merger before its starting date, and when the energetic new director arrived a month early to ease himself into the job, he found himself in the telephone padlocked, and new names plates with impressive sounding titles from the old institution fixed to all the staff doors.

When the starting date arrived, he removed them himself. Mr Bird said: "He's the sort of person who gets things done. We wanted someone who

problems. Humberside now has links with European and third world countries and support from the Overseas Development Agency on fishing training, and Stoddart, on various fishing committees. "I am," he says "Big Fish."

After seven years in Hull he felt ready to move, although he did consider staying to see the Grimsby merger through. It is an indication of the close links Humberside has built up with local industry that he was about to negotiate a secondment from the college to a general management position in industry, when the Sheffield job came up.

At the time he was on holiday in France, reading an English newspaper on the beach, when he saw the post advertised. He telephoned his secretary immediately to let the polytechnic know he was interested.

It was a characteristically informal approach.

He is likely to make his mark quickly on Sheffield, going by the speedy appointment of two assistant directors – Mario Morissani and Jack Hobbs, his assistant at Humberside – whom he knows well from the CNA.A. He is guarded about plans, but says one of the first things he will do is talk to the university about cooperation in areas where both institutions are strong.

His history of attracting outside interest and funding to Humberside will undoubtedly be repeated, while he has created student access, including part-time work, and for giving access priority over sustaining the amount of money spent per student.

Although that seems an unlikely stance for someone as heavily involved in the CNA.A. as John Stoddart, it will face in the colder climate of nationwide retrenchment and the South Yorkshire establishment.

records with his emphasis on equalisation: institutions being visited by one of his visiting parties are invited to have observers at meetings.

He supports the CNA.A's attempt at "Partnership in Validation", and generally "trying to conduct things with a more relaxed attitude," he says. Nevertheless, colleagues have said him deal witheringly with polytechnic staff who were not apparently taking CNA.A. visit seriously.

Something else he will do on arriving to Sheffield is to take up smoking again. He was in the national rugby squad as a schoolboy, and only gave up the sport when he went to Hull. When he came to visit Sheffield, he found the buyer of his boat was willing to sell it back to him.

He chose to re-enter the moving world earlier this year with a visit to Henley – something which fits well with a man whose London address is the Reform Club, but less well with his Liverpool accent and leftward leanings of John Stoddart.

He never rows for established clubs, he insists, and the Reform is simply a base for the contacts he wanted to build up for Humberside. "When he went there, he says, he had 'explode the ignorance' of civil servants in London, who thought of Humberside as 'up the top on the right'."

So it is ironic that just as he began Humberside, the college has begun to gain the support of the Department of Education and Science in defence of advanced nautical education, and to lose a sizeable chunk of its work.

As if that was not enough, Dr Jack Earls, his successor at Humberside, was rushed to hospital with appendicitis the week he started the job. People in Hull must be wondering if John Stoddart has taken a charmed life, as he has been in the colder climate of nationwide retrenchment and the South Yorkshire establishment.

Playing the game – more or less

Sir Edward Parkes's last battle before he retired as chairman of the University Grants Committee was with the universities – he tried to get them to say "no" to the Government request to take more students.

He wanted them to say firmly and with force that they could not take more students without more money because of the long-term damage this would do to their recurrent grant in terms of spending per student.

Sir Edward either wanted to get more resources from the Department of Education and Science, or at least a pledge that the present exercise on numbers would not be used to hold down future grants.

But the vice chancellors would not agree. Some because they could not withstand the public interest argument that good students were being denied places; some because they thought there was something in the deal for them – no extra Government money but student fees and maintenance allowances; and some because the students could be accommodated in the margins and did not want to fight an empty battle.

So it is up to Sir Peter Swinnerton-Dyer, Sir Edward's successor, to try to draw up the terms of a bargain with the universities' future interests. He has little to bargain with – but his major task would seem to be to attempt to break down the unit of resource (expenditure per student) as much as possible into different categories – medicine, laboratory-based sciences, social sciences, arts.

Although numbers can never be entirely separated from money, a more sophisticated formula could actually help the universities. So though a pledge on future action may not ensue, the UGC and the Government might agree on how the sums should be worked out.

Meanwhile, the universities are in the process of deciding whether to take extra students, and if so, where and how many. The UGC in its letter to the universities, used as

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Tertiary education is still the preserve of the rich in Australia. Geoff Maslen reports on a survey

Workers' children still disadvantaged

Higher education in Australia continues to be the preserve of the better off members of society despite the fact that since the 1940s the number of university students has doubled every dozen years or so: despite the massive growth in enrolments in the advanced education sector; and despite the financial assistance schemes available to poorer students.

Although there has been a slight reduction in the proportion of students drawn from the upper class, it remains over-represented in higher education by a factor of about six. The lowest groups, those from the working class, the children of blue collar and unskilled workers, remain constantly under-represented.

Only in the technical side of further education is there a reasonably accurate reflection of the social spectrum of Australian society.

These are the conclusions drawn by two researchers at the Australian National University, Dr D. S. Anderson and Dr A. E. Vervoorn. In a mammoth review of government statistics and almost every study on the social background of post-secondary students published over the past half-century.

The summary of their research, *Access to Privilege: Patterns of Participation in Australian Post-secondary Education* concludes that "despite all the innovations and reforms which have taken place in recent decades there is little evidence of it having helped to bring about a more equitable distribution of wealth and status."

From whatever perspective, one views participation in higher education — race, class, sex or school background — it is the children of an already privileged minority who mostly gain admittance.

"Using the holy trinity of sociological indicators of social position; — income, occupation and education — the conclusions of numerous studies carried out are clear and unambiguous: university students and, to a lesser degree, college of advanced education students, are of above average socio-economic status, with a much higher proportion of students coming from professional and managerial families than would be expected on the basis of the proportion of these occupations in the workforce."

The growing realization that Finland's 20-year act governing higher education, implemented since 1966, has little time to run may spark off a debate on whether such legislation is needed in the future, and what sort of values should determine the interaction between universities and society.

Dr Juha Vuorinen, acting executive manager of the influential Helsinki-based Foundation for Research in Higher Education and Science Policy, is concerned that so far there has been barely a whisper about this potentially explosive issue.

He said: "The current climate is not conducive to debate. It seems that many professors don't want to discuss matters, due partly to fatigue after introducing the last batch of measures. We're a little bit lazy just now, and we're short of studies into higher education. But it is essential that we raise our voices now rather than criticizing after new reforms are implemented."

Such a complaint is another manifestation of the uncertainty facing higher education throughout Western Europe. In Finland's case the "evaporation" of optimism, since the 1960s when the Robbins report and expansionist Swedish models provided guidelines, has perhaps not been so pronounced as the international average — but it undoubtedly affects policy-makers and does alike.

The period of the existing act has been one of frenetic change, especially in its earlier phase. With one university per 280,000 people, Finland can boast a European record. Quarrels between the "old" foundations of Helsinki and Turku and the plethora of shiny new ones in small towns have started to fade. The consistent political complexion of coalition governments — a fulcrum slightly left of centre, and an equitable-looking mix of urban and rural interests — has perhaps provided an element of stability.

Dismissing arguments that Helsinki (with 23,000 of Finland's 85,000 students) should in future concentrate on postgraduate studies and research while devoting teaching responsibilities to others, Dr Vuorinen believes the capital city university is fated to offer the whole gamut of

WORLDWIDE

Similarly, a much lower proportion of students come from families in which the breadwinner is a skilled or unskilled manual worker. "The privileges, prestige and affluence to which higher education usually gives access tend accordingly to remain in the social strata already possessing them," the authors write.

At Melbourne University, for example, figures collected over 20 years reveal an amazing constancy in students' backgrounds. More than 50 per cent of students in each year's intake since 1962 have fathers who work in professional or managerial areas — although these groups make up barely 25 per cent of the Victorian male workforce aged 45 and over.

In contrast, fewer than one in four new students have fathers who work in transport, the armed services, the trades, or who are process and production workers, although these groups make up about half of the same male workforce.

Or consider background: one quarter of the Australian population is Roman Catholic and about four out of every five Catholic children attend a Catholic school. This makes up the bulk of the private school sector and fewer than 5 per cent of Australian children attend non-Catholic private schools. The remaining 76 per cent of the school population goes to government schools.

But despite the numerical superiority of government and Catholic school students, every study over the past 40 years reveals that students from non-Catholic private schools stand a better chance of getting access to higher education. In part, that is a result of scholastic cramming, of the emphasis these schools place on passing examinations. In part, it is a consequence of the fact that up to 90 per cent of students in independent schools stay on to Year 12 compared with less than half that figure in Catholic and state schools.

An investigation of students in various professional faculties at six uni-



Aborigines need a drastic improvement in economic and social conditions.

versities showed the extent of the bias against government school students. At one extreme was medicine where, on average, a third of the students came from government schools but 35 per cent were from non-Catholic private schools. At the other extreme was teaching, in which two-thirds of the students came from government schools and only 15 per cent from independent schools. Catholics made up a little more than a quarter of the student body in medicine and law and only 17 per cent of those studying to be teachers.

According to Anderson and Vervoorn, medical students particularly are, in many respects, more unrepresentative of the community than any other group in the entire post-secondary sector. They are young, (aged 17 or 18 at entry) their experience has been limited to school and family, they tend to be from select schools and social strata, and educationally their curriculum has been constrained by the necessity to get top marks in the subjects required for quotas.

If the rewards of academic scholarship disproportionately go to independent school students, the opposite is true for those from aboriginal and migrant backgrounds. Although, contrary to popular prejudice, both traditional and urban aborigines attach considerable importance to education, few aborigines have entered post-secondary institutions in the past and fewer have graduated. According to the 1976 census there were only 78 aboriginal people with degrees in Au-

stralia — out of a population of 160,000.

Later figures show a marked increase in the number of aboriginal students taking degree and diploma courses but according to Anderson and Vervoorn, participation by aborigines in post-secondary education will not approach the community average until there is a drastic improvement in their overall economic and social conditions.

Among the ethnic minorities studies show that students from migrant backgrounds are at least as likely as Australians to undertake higher studies. But this is only because some groups — notably the Asians and the Eastern Europeans — participate in higher education at a rate much higher than their presence in the population and so compensate for the other groups.

More than any of the other disadvantaged groups in Australian society, women have made astonishing gains in this field — although there remain in a minority. In 1948 there were fewer than one in five female university undergraduates. Today, 45 per cent of students studying for bachelor degrees in universities are women, while in colleges of advanced education, the figure is just under half. Moreover, the number of girls staying on to Year 12 of secondary school is now greater than the number of boys, and more girls than boys are successful at the HSC examinations that conclude secondary school. If the sex ratio in the transfer to higher education remains constant, female undergraduates will

outnumber males within three years.

Despite this, there continues to be a very uneven distribution of students across courses. Nearly 60 per cent of the students in the education, law, fine arts and social sciences in Australian universities are women, while in law, medicine, economics, natural sciences, architecture and agriculture, women are woefully under-represented. In engineering, only 20 per cent are female.

The danger these restricted choices poses for women is a lack of teaching, which has long been an area of upward social mobility. At peak, teacher studentship was supported more than 50,000 students, providing them with a salary and tuition. The savage reduction in teacher training places over the four years and the relatively small allowances now available must have deterred many from entering the education.

"Given the general downward employment opportunities in a society where there will be a move to earlier social patterns with numbers of bright students, particularly girls, not proceeding to higher education," the researchers say.

The federal minister for education and youth affairs, Senator S. Ryan, has already declared that government policy is to make higher education more equally distributed throughout the community. But according to Anderson and Vervoorn, real change can only come if, at the same time as improvements of the handicapped, there is a corresponding addition to the top of the system.

On this criteria, Senator Ryan's rhetoric has not been matched by political realities. The Hawke government's first budget in August 1983 only a minor increase in gross higher education to allow an extra 3,000 students to be enrolled — an increase of less than 1 per cent.

Anderson and Vervoorn agree the upper participation rate in universities and colleges should be the present one, which amounts to 22 per cent of each generation. To do this, many more children need broader cross-section should be encouraged to complete secondary school than the present one in five.

There should also be alternative ways of gaining access. *Access to privilege: patterns of participation in Australian post-secondary education*, by D. S. Anderson and E. Vervoorn, Australian National University Press. AS15.50.

The next 20 years on Finland's agenda

academic pursuits.

Since it would be preposterous to dismantle any of the new provincial universities (though they are arguably too numerous), they should each be allowed to hollow a niche in select disciplines for which they are best suited, avoid wasteful duplication, cooperate with one another, and recruit their students accordingly. The drawback to this scheme is that middle-tier universities in three well-established intellectual centres (Turku, Tampere, Jyväskylä) could be left on a limb.

Perhaps more critically, the universities are failing to articulate the type of values they should embody. Indeed, Vuorinen would say they are now formulating the question about how much their overall strategy and curricula should be tailored to manpower forecasts, to the demands of industry and commerce, and to the more abstract ideals that have little obvious relation to contemporary materialism. Below the silent surface, it is surmised, two schools of thought do exist: the "realists" persuaded of the right of employers and economic planners to have a say in university life, and "philosophers" who still champion liberal humanism (dealing with noble goals worth pursuing per se).

"Despite a post-war influx of some Anglo-Saxon ways, temperamentally most Finns prefer to have clearly written regulations to define the framework within which they prefer their lives and Mr Markku Linna, divisional chief in the ministry of education, believes a new act on higher education is necessary. It would be inconsistent not to have one when we have legislation concerning all that levels of education. A law in expression of faith in the value of teaching and scientific research, it gives the secure feeling that such activities can be sustained for generations."

economic trends over, say, 20 years."

A clear indication of government intent to introduce a new law is the existence of a ministerial working party, which will have submitted a report on the topic well before most university staff have aired their views.

Mr Linna is convinced that without legislation many of the achievements recorded since 1966 would not have been as spectacular as they have proved to be. As things are, the last 17 years have seen the number of university teaching staff more than double, and the emergence of a more balanced profile between the subjects students read and the requirements of the labour market. On the desirability of involving more adults in higher education, Mr Linna considers that a loosely-framed law would best encourage action and help put an open university on a solid footing. It would be premature to predict how university research funds, 16 per cent of government research funds, will be placed on the research ladder in the future. (In Finland, where research GDP last year, the state channels almost half the resources available for this end.)

Whatever their attitude to all-embracing laws may be, Finnish professors are acutely aware of the finite nature of resources compared with the infinity of the scientific challenge. It is here that the acrobatics of inter-university and regional rivalries is still to be heard.

Hence Professor Johan Wrede, a new vice-rector of Helsinki University, is seeking of equality that transcends an "ideology of policy". In 1982, he says, the ministry of education's assessment of how resources should be distributed to Helsinki University was based on the position of the university actually enrolled

for distant Kuopio, the figure was 130-140 per cent. "If you compare Helsinki with seven other universities," Professor Wrede writes, "you find that in 1983 it is expected to educate the average student with 70 per cent of the book funds, 50 per cent of the departmental money and just 40 per cent of the educational aids that the others command."

However, more than money is at stake. To return to Dr Vuorinen, "the present law-based resources and numbers, whereas we should be bringing in qualitative considerations, such as the question of what higher education is for and say exactly how."

Should a new act emerge, taking Finland into the twenty-first century, Dr Vuorinen believes it will be primarily a home-grown solution, with reliance than before on foreign examples. He fears that the universities could forfeit more of their autonomy to government officials, many of whom are party trustees, if the professors do not start speaking out soon.

Turning to standards, one of the prime issues neighbouring Sweden, Dr Vuorinen is not concerned for the time being about trends among staff rather than students. "Our universities are now full of youthful professors and lecturers who won't be retiring for another 20 or 30 years, but new posts are being created. At Helsinki, there are 16 assistants in mathematics, all of whom are doctors, hardly any of whom will obtain a professorship. With so few opportunities, shan't get new blood. The best brains will go elsewhere, and when posts do fall vacant they'll be filled by second-class doctors."

Among students Dr Vuorinen detects pessimism, the feeling that science may open up new worlds to a good job but is not really for human beings. Despite the smallness of the economy and the scarcity of resources Dr Vuorinen is still a believer in diversity and academic autonomy. "Universities should allow many flowers to bloom."

A much larger number of dismissed Central European physicists appeared on AAC lists of "available" but were not successful in obtaining

How Britain lost the physics war

This year marked the fiftieth anniversary of the Nazi rise to power in Germany, an event unlikely to have been celebrated anywhere but one which did produce an exodus of some of the most talented Central European scholars, with important benefits for research elsewhere. Even a partial list is impressive:

Hans Bethe
Max Born
Richard Courant
Max Delbrück
Albert Einstein
P. P. Ewald
Immanuel Estermann

Kasimir Fajans
Otto Frisch
Maurice Goldhaber
Gerhard Herzberg
Leopold Infeld
Fritz London
Rudolf Peierls

Bruno Rossi
Erwin Schrödinger
Francis Simon
Leo Szilard
Edward Teller
Victor Weisskopf
Eugene Wigner

Though Britain offered them refuge and numerous short-term visiting fellowships, permanent posts were available to only a few, and in the end this country lost the contributions of some of the most outstanding scientific minds of the century. PAUL HOCH describes how we lost the world's best physicists.

"The migration to the United States of European intellectuals fleeing fascist tyranny has finally become visible as the most important cultural event of the second quarter of the twentieth century." So the American intellectual historian H. Stuart Hughes noted in his book *The Sea Change*. The same might be said for those refugee scholars who migrated to Britain and were absorbed into British universities.

However, by far the greater proportion of intellectual refugees to Britain were not absorbed and so re-emigrated, going on to make their contributions elsewhere, notably in the United States. Of the 21 figures listed, no fewer than 17 (all except Born, Frisch, Peierls and Simon) were to re-emigrate from Britain, mainly because they were unable to find permanent posts. Subsequently, 15 obtained posts in America.

Moreover, of the 17 re-emigrants, no less than 13 were primarily oriented toward mathematical or theoretical physics rather than the rigours of laboratory experiment. Percentages are misleading but it is undeniable that the re-emigration of people of this calibre had permanent effects on the scientific community in this country and became the basis of a general transfer of the main centres of world science from Europe to America.

In the end, the crucial difference between Britain and America (apart from the British bias toward laboratory work) may be that the rising American industrial capitalism of the 1920s and 1930s furnished the resources and the inclination to expand its higher education system, physics departments and outside industrial laboratories far beyond our capacity.

The United States permanently absorbed far larger numbers of refugee Central European scientists than any other country. The net result did even worse than Britain in this regard, expelling almost all of its refugee scholars in the Stalinist purges of the latter 1930s.

One of the most outstanding theorists to be absorbed into this country, Sir Rudolf Peierls, recalled the environment which he associates with the conditions of economic depression of the time. "It was hard to get support for new schemes. The universities, at least in Britain, were static and there were very few new posts, so that vacancies occurred [almost] only through resignations, retirement or death." In an interview with the American Institute of Physics, Sir John Cockcroft pointed out that even at the Cavendish Laboratory at Cambridge, "there was a very limited number of jobs... [and] whenever positions became vacant, there were a lot of [local] young people who wanted them. So it wasn't very easy to fit a large number of refugees into the Cavendish at that time."

Nevertheless, with the help of charitable funding, channelled principally through what was then called the Academic Assistance Council (AAC), a large number of refugee scholars obtained temporary research fellowships at Cambridge and at other British universities. The UK, perhaps more than any other country, was able to provide intellectual emigrés, many of whom were discouraged by the limited job prospects to come to Britain at all.

Both groups included in their ranks many of the most prominent German, Spanish, Italian, Austrian, Czech, Polish and Hungarian physicists who, one would have thought, would have been the first to be accepted into British physics. Those re-emigrating included Albert Einstein (who was at Christ Church, Oxford, in 1932 before going on to the Institute for Advanced Study at Princeton); Erwin Schrödinger (who left a five-year post at the Magdalen College, Oxford, after only three years to take up a professorship at the University of Graz in Austria, before going on to the newly founded Dublin Institute for Advanced Study); Hans Bethe (who was able to obtain only short-term visiting posts at Manchester and Bristol before taking what was to be a permanent post at Cornell); and Fritz London (possibly the most prominent low temperature theorist of the day, who in 1936 left Oxford for Paris, quickly obtaining an American post at Duke).

A much larger number of dismissed Central European physicists appeared on AAC lists of "available" but were not successful in obtaining



Einstein surrounded by other top scientists at a luncheon given by the Emergency Committee of Atomic Scientists in Princeton. Selig Hecht is on Einstein's left. Victor Weisskopf, S. Szilard, and Hans Bethe are first, second and third left in the back row.

programme involved at least 18 prominent refugee scientists in physics and chemistry at several British universities. At Oxford, F. A. Lindemann, who had interested ICI in the first place, argued strongly for the programme's extension, noting that several of the men involved had been offered senior appointments abroad, including Schrödinger. Others "would have no difficulty in finding similar positions," he insisted, and suggested that fellowships of five years duration be implemented. Not only was this unacceptable, the whole scheme was gutted. Although a number of refugee scientists obtained posts in British industry in the latter part of the decade, government sensitivity about employing foreigners meant that comparatively few were able to maintain continuous industrial employment.

The major barriers to British integration of refugees don't seem to have been based on racial or religious prejudice. Peierls in one of his interviews recalled that both he and Bethe in 1933 were passed over for a fairly low-ranking demonstrator post at Cambridge. After Bethe subsequently obtained a one-year replacement post at Manchester, Peierls also received a very encouraging note from the then professor there, W. L. Bragg, about his chances for a second post. Bragg, however, then wrote a second letter nothing that Peierls could not be given this post because "there was too much resistance in the university to giving jobs to foreign nationals when there was in fact so much unemployment among academic people in England", an argument Peierls recalls being voiced in the newspapers when Manchester earlier gave a chair in physical chemistry to Michael Polanyi.

Bethe has recalled that though he felt welcome very much in England, he found integration much easier in America. "England had been used to having Englishmen and Commonwealth people in its universities. American had been a country of refugees from the beginning." In a 1934 letter to the director of the Physics Laboratory in Bristol, Bethe noted that he felt he had to accept the Cornell offer because, "although I would have preferred to remain in England, I believe it would be very difficult to get a permanent post in your country."

Max Perutz, an Austrian expatriate who worked in J. D. Bernal's crystallography laboratory at the Cavendish in the period, remembers being somewhat surprised at the number of his fellow scientists who were avowed communists. On the other hand, he told an interviewer for the Imperial War Museum refugees project, "in the colleges and among the wealthy people, Hitler was regarded as a bulwark against communism and Jewish stories of Nazi atrocities as propaganda." Perutz, along with the young Herman Bondi, was also to be one of the almost 27,000 overwhelming Jewish refugees interned in camps as "enemy aliens" in 1940, a number which included a very high percentage of the refugee scholars. Peierls, whose brother was interned on the Isle of Man, recalls the general sentiment as a "panic mania done with remarkable insensitivity and pointlessness." Another sent to Canada amid much bitterness was Klaus Fuchs, a member of Max Born's group at Edinburgh.

Granting the special anxieties caused by the war and the earlier depression, it is clear that the main barrier against large-scale permanent integration of refugee scientists in Britain, at least as compared to America, was structural and sociological. The British university physics community and the university community generally, was quite small compared to that in America. This reflected the relatively circumscribed social functions of British universities in what was then quite openly proclaimed to be an elite society. The universities of that period saw it as their main function to condition (that elite, and there was comparatively little of the creed — then coming in at American state universities — of higher education for the masses. The percentage of Britons aged 18 to 22 in higher education was (and is)

small compared to America and the Soviet Union: even 20 years after Robbins it is still only about a third of that in the US, USSR or Japan. In a climate like that of the 1930s, geared much more exclusively to the social conditioning of the elite, it was implicitly clear that foreigners had comparatively little to offer. It is only with the hindsight of our much more mercenary and research-oriented rationales for the university that the non-integration of the world's most eminent scholars seems somewhat astounding. The magnitude of their potential contribution only began to sink in with their contribution in the war years and the development of radar and atomic weapons.

It should be remembered that, in the early 1930s, British physics was still heavily concentrated on Cambridge and — despite Rutherford's nominal presidency of the AAC — the Cavendish Laboratory's director consistently opposed increasing the concentration of refugee physicists at any one centre (including his own) because of the possibility of arousing an anti-Semitic backlash. (Then, as now, the main cause of anti-immigrant sentiment was assumed to be the presence of immigrants.) For example, when the refugee Walter Heitler proposed taking up his AAC fellowship at Cambridge he was advised by the AAC that this would be impossible because they had heard from Rutherford that "some of the Cambridge departments are anxious to avoid the dangers which may come from too great a concentration of foreign scholars in one place." The AAC even went so far as to warn the Bristol physics laboratory which employed Heitler that, except for a postgraduate seminar in his specialty for which no suitable British candidate might be found, refugee scholars on AAC fellowships were in general to be excluded from teaching "in order not in any way to injure the interests of British university teachers whose work might be injured if German scientists supported from outside undertook duties which they themselves would otherwise have to discharge." Though the coming of the refugees did a good deal to strengthen the British physics community in important new centres, especially low temperature physics at Oxford and mathematical physics at Bristol, Edinburgh and Birmingham, the high degree of centralization still present in the 1930s (as well as the bias to experiment) worked to retard the absorption of greater numbers, at least in contrast to the much greater opportunities offered at geographically diverse American state universities and technological institutes, as well as such up-and-coming new physics centres as Duke, Stanford, MIT, Purdue, George Washington and Notre Dame.

Remarkably enough, the AAC actively encouraged the re-emigration of many eminent academic refugees to what they saw as more permanent posts in America. It even went so far as to pay travelling expenses for lecture tours designed to make job contacts, sometimes in direct opposition to the main American academic refugee committee (the Emergency Committee to Aid Displaced Foreign Scholars) which was wary of attracting too many European competitors on to the American job market. The AAC/SPSL's general secretary in a 1939 article in *Queen's Quarterly* openly proclaimed that "Great Britain is one of the several 'clearing-house' countries; the United States is the main terminal country." This is indeed the way it worked out, with consequences for the subsequent development of British science and technology which we are only just beginning to grasp. To this day, Britain (with honourable exceptions like Peierls and Nevill Martin) remains seriously deficient relative to both the USA and USSR in theoretical physics. If only those refugee theorists passing through Cambridge in the spring of 1933 had been given permanent appointments the whole balance of world physics could have been substantially different.

Granting the special anxieties caused by the war and the earlier depression, it is clear that the main barrier against large-scale permanent integration of refugee scientists in Britain, at least as compared to America, was structural and sociological. The British university physics community and the university community generally, was quite small compared to that in America. This reflected the relatively circumscribed social functions of British universities in what was then quite openly proclaimed to be an elite society. The universities of that period saw it as their main function to condition (that elite, and there was comparatively little of the creed — then coming in at American state universities — of higher education for the masses. The percentage of Britons aged 18 to 22 in higher education was (and is)

The author is senior fellow in social and technology policy at the University of Aston. This is a condensation of a paper which appears in the current number of *Annals of Science*.

Donald Fien

From rags to intellectual riches

Donald Hawes looks at two academics who rose from humble origins

Jude the Obscure's aunt was uttering a commonplace of the time when she told him that Christminster (ie Oxford) was "a place much too good for you to have much to do with, poor boy". It hardly needs saying that few working-class men, let alone women, could hope to go to Oxford or Cambridge 100 years ago. Indeed, Joseph Wright and Thomas Okey, the heroes of this article, never attended English universities as students, since both were manual workers in their boyhood and early manhood. Yet such were their qualities of character and intellect that each became a distinguished university teacher: Wright deputy professor (1891-1901) and the professor (1901-24) of comparative philology at Oxford and Okey professor of Italian (1919-28) Cambridge.

Wright's six-volume *English Dialect Dictionary* (1896-1905) is the abiding monument to his scholarship. Many students of Old and Middle English have also been familiar with his grammar textbooks. But amazingly enough, he was illiterate until he was 15 years old. He was born in 1855 in Thackley, near Bradford. The second of four sons, he early had to help to support his widowed mother in conditions of desperate poverty. When he was six, he worked as a donkey-boy, driving a cart carrying a quarrymen's tools from 7 am to 5 pm daily for a few pence a week. At the age of seven, he started work in a woollen mill and remained a millworker until 1876. He determined to learn how to read and write in 1870 when he listened to fellow-workers reading aloud from the newspapers some of the exciting events of the Franco-Prussian War.

Wright - the Bible, Pilgrim's Progress and Cassell's Popular Educator, first lessons in language.

At first, he taught himself with the aid of the Bible and the *Pilgrim's Progress*; then he attended evening classes of various kinds and studied the fortnightly parts of *Cassell's Popular Educator*. He learnt French, German, Latin, shorthand and mathematics. Soon he was running his own night school while still working as a wool-sorter by day. Having saved £40, he travelled to Germany in 1876 and attended almost one semester (all that he could afford) at Heidelberg University, applying himself to the study of mathematics and the improvement

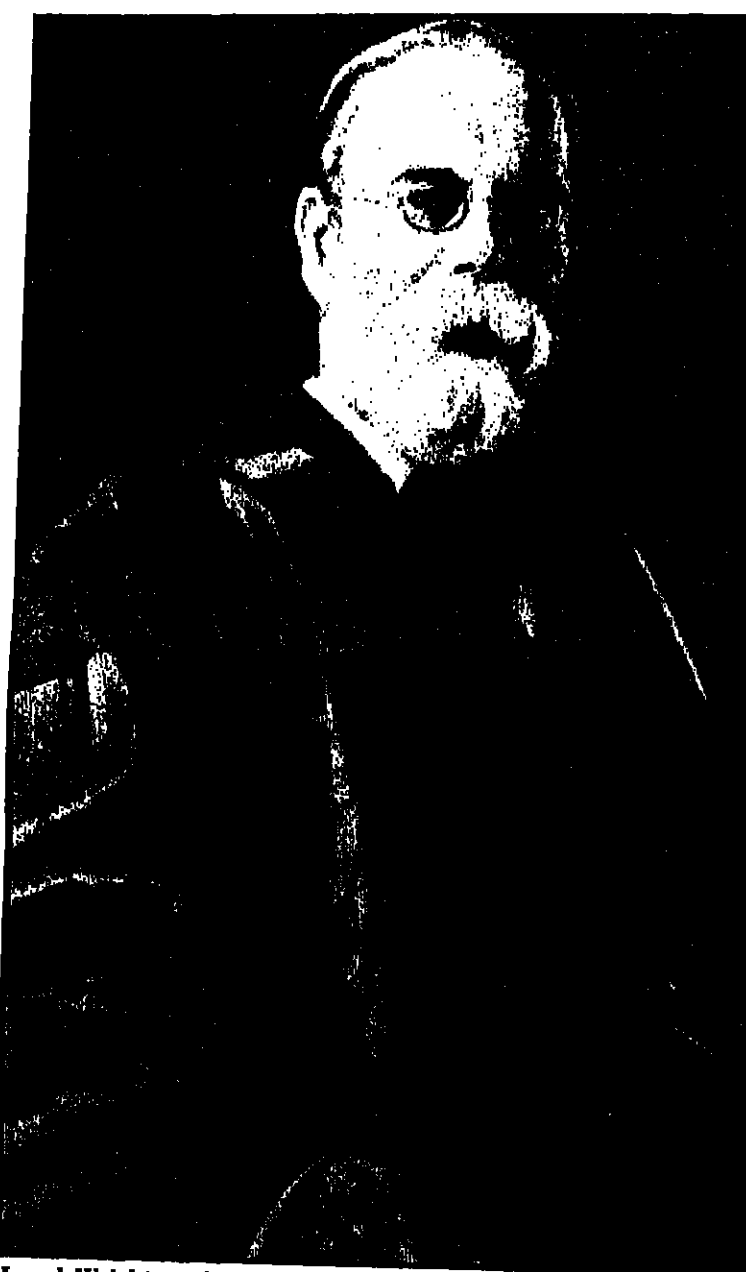
of his German. Back in England, he became a schoolmaster, extending his spare-time studies to include Greek and chemistry and matriculating as an external London University student in 1878.

Eventually, he returned to Germany and studied between 1882 and 1886 at the universities of Heidelberg, Freiburg-im-Breisgau and Leipzig. His original intention was to study mathematics but he became fascinated by comparative philology, to which he decided to devote all his time and energies. In 1885, he gained a PhD at Heidelberg for a thesis on the qualitative and quantitative changes of the Indo-German vowel system in Greek.

Thenceforth, Wright was a recognized authority on philology and was active for the rest of his life in teaching and in publishing books and articles. Before his professorial appointments, he was, among other things, a lecturer in German for the Association for the Higher Education of Women in Oxford and for the Twyford Institution. Besides the great dictionary, his books included primers of Old and Middle High German and grammars of Historical German, Old and Middle English, Gothic and Greek.

Even that brief account of his career should show that Wright was a man of prodigious drive and energy, systematic and thorough in all that he undertook, whether teaching, writing or engaging in administration. His wife wrote that "he studied laboriously with every ounce of his physical strength and all the force of his tremendous personality, to fit himself to be useful to the world, to produce what would advance knowledge, and inspire and help others to do likewise." These qualities "sometimes jarred in common room circles," as J. Boyd Deland puts it in the *Dictionary of National Biography*, but they made him a highly effective teacher. His determination and self-reliance are clear in his assertion, made in late life, that "a man can make his way at Oxford if he has the will; it does not depend upon birth or social status, but work." Words that would have a hollow ring in the ears of the kind of would-be student personified by Jude the Obscure.

When he gave evidence to the University Commission of 1920, he defined the duty of a professor in a typically down to earth way: it was to teach others the subject he professed, partly by writing textbooks that would remedy the defects of those already in existence. This was the duty he fulfilled to the utmost, continuing to work during his retirement despite illness. He died in 1930.



Joseph Wright: worked as a donkey-boy

Thomas Okey also entered the academic world after inauspicious beginnings, although he grew up in slightly more fortunate circumstances. He was born in Spitalfields in 1852 and attended a dame school and a National School in Bethnal Green until he was 12 years old. Between 1865 and 1866, he was successively an apprentice, journeyman and master basket-maker, toiling for the first 15 years of his time in an unpeopled, rat-infested cellar for 12 hours a day.

Like other aspiring young workmen of the period, he became involved with secularist and republican movements and took a keen interest in positivism, Darwinism and socialism. He debated freely and (inevitably, one feels) became a leading member of the Social Peace Ethical Society. He listened to T. H. Huxley, knew Ramsay MacDonald and George Lansbury, and became a friend of Shaw's.

From boyhood, he had been fascinated by foreign languages. An early ambition, he tells us, was "to open a shop for the sale of baskets and proclaim 'ici on parle français.' Since at first he could not afford to attend evening classes, he taught himself Italian by using Ollendorff's *New Method of Learning Italian*. He exchanged lessons with "native refugees" and others and attended Sunday services at French, German and Italian churches in London. Meetings at a German socialist club in Soho gave him excellent practice in German.

Later, he went to evening lectures on history and other subjects organized by the University Extension Society and found time to read in the British Museum. During European tours organized for students and associates of Toynbee Hall, he astonished his fellow travellers, who included "university men," with his command of languages.

He was teacher of Italian at Toynbee Hall between 1892 and 1901. At the turn of the century, he also began to make his name as a writer, first as a translator of Dante for Dent's *Temple Classics* and then as the author of popular educational books such as *Venice and its Story* (1903) and *Pari and its Story* (1904). He wrote scholarly articles and contributed to the *Cambridge Modern History*.

But he always retained a close association with basketmaking, publishing a book and an *Encyclopaedia Britannica* article on the craft. In 1919, when he was 67 years old, he diffidently stood for the newly-endowed post of professor of Italian at Cambridge and was elected. Apparently, he almost wrote to the vice-chancellor declining the office but he was reassured by a letter from Sir Arthur Quiller-Couch, the professor of English literature. This kindness Okey always remembered and later he made wastepaper baskets for Sir Arthur and the dean of Jesus College as tokens of his gratitude.

Okey - tokens of gratitude - hand-made wastepaper baskets for 'Q'.

Unlike Wright in his modesty, he was like him in his devotion to teaching. In his unpretentious *Inaugural*, Okey said that his aims were to interest people in classic and modern Italian subjects and to win their sympathy for the Italian nation, thereby rectifying in part the nineteenth century "set towards Teutonism." He remained as professor until 1928 and died in 1935.

Both men were devoted to the study of language and to teaching it. Having had to struggle themselves, they were pleased to help other students to attain knowledge and appreciation. Both were perfectionists, if only to compensate for their lack of orthodox education. Both seized the opportunities to better themselves. Okey was fortunate in working in London, where he could find people and institutions to give him assistance and practice. Wright, in a harsher environment, was enterprising enough to go to German universities.

We must, in reading their life stories, give due credit to such organizations as the Mechanics' Institute in Bradford, Heidelberg University and Toynbee Hall. But both scholars are remarkable, above all, for their perseverance and determination. *Smiles' Self-help*, first published in 1859 when Wright and Okey were boys, originated in addresses he gave to young men "of the humblest rank" eager for self-improvement. Wright and Okey went on to be perfect exemplars of the "energetic individualism" which Smiles admired.

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WHERE NEXT?

My God, what's happened to it? If only it could all be like it used to...



...men alone against the elements, the quest for food thrusting him onward into unknown territory - armed with nothing but a stout twig and the odd pebble...



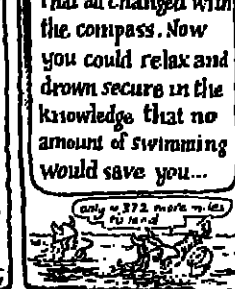
...Ooh, yes. Persons were REAL persons in those days. But humankind couldn't leave it alone, could they. Oh, no. They had to invent things. Ships! Bloody clever that was...



...and followed very shortly by the invention of drowning...



...of course, in the early days boats all followed the coast. You could always swim for it. That all changed with the compass. Now you could relax and drown secure in the knowledge that no amount of swimming would save you...



...In polar exploration, huskies were soon replaced by enormous track vehicles - much more suited to falling into luddite crevasses. Bloody brilliant...



...and then they invented space exploration. Now you could really get into trouble...



...but now it's all MURK! It's bloody amazingly safe, now. Now there's so much stuff to take...



Whither geographical exploration?

Methods have changed but the modern explorer still needs a sense of adventure says Sir Vivian Fuchs

al regimes of tropical forests and the life dependent on them. Insidious climatic changes alter the delicate balance of desert margins and affect the life of millions who live unaware of nature's potential threats. Now man exerts a powerful influence on the natural order, so there is an urgent need for studies which will enable us to guard our environment against our own unthinking misdeeds and preserve it for future generations.

All such factors come within the purview of geography, which seeks to provide an all-embracing picture of the world which is our home. For our own preservation we must have the knowledge which can enable us to forecast future trends, and perhaps enable us to guide their course. Such information must come largely from observations on the ground, and the door is therefore wide open for the modern explorer.

There are other fields of study which seem perhaps to have less effect on man's future. Those aspects of geophysics like geomagnetism and gravity are valuable in geological interpretation, and can well be a necessary part of exploration, though upper atmosphere geophysics concerned with the ionosphere and magnetosphere, which are also part of the global environment, can scarcely be regarded as within the "geography". On the other hand, oceanography in all its branches must certainly can. Here indeed is opportunity for exploration since we still know little about the deep ocean floors. Furthermore, the heat and water exchange between sea and atmosphere is one of the most important factors in determining both the form of the land and its habitability.

With all these different fields of investigation open to us one may next ask what drives someone to follow any one of them in the uncomfortable, even dangerous, situations which are quite usual in out-of-the-way parts of the world? For the scientist it is easy. He or she wants to extend knowledge of his or her particular discipline into previously untouched areas. If we are more aid to arrival and supply in the field than a direct research tool. The geologist must still walk on rocks, the biologist handle and observe subjects on the ground. Likewise man's newest tool, the satellite, can provide broad coverage of the entire globe in many parameters, but always there is the need for ground-truth observations to make possible the interpretation of results.

Clearly such technological advances during this century have had a considerable effect on the way exploration is now carried out. But the nature of exploration has changed dramatically. No longer is it a matter of discovering new mountains, lakes or rivers - all such features are shown in modern satellite imagery. But even before its advent the unknown areas of the earth's surface had been reduced to negligible proportions, and the question which constantly recurs is "What then is left for the explorer to do?"

The answer is that for many years the seeking for physical features has been replaced by scientific curiosity. We look now to interpret the geology, to decipher the record of past climatic and other events contained in an ice sheet, or to solve the ecological

them to longer more serious field work in later years.

Looking at the world as a whole from the point of view of exploration, the broad fields appear to be tropical rain forest, hot deserts, the temperate and polar regions, with high mountain areas forming a fifth complex category. Work in all these places has gained from advances in technology and materials. It has also to be recognized that the requirements of scientific research are placing increasing demands on the administration and provision for exploration. No longer is it sufficient merely to collect and to observe. Complete equipment, often delicate or heavy, and frequently requiring electric power, is now a necessary commonplace. Indeed the equipment of the laboratory is being carried into the field. Some will be of a static nature and remain at base camp, but much of it must move with the travelling scientist. Thus the advances of technology, although contributing to more efficient work, and often easing the lot of the explorer, also produce their own new problems.

For example the fearful physical endurance needed by the Scott and Shackleton expeditions at the beginning of the century is no longer necessary. But the unknown hazards they faced have been replaced by other risks associated with the very means that are now used to remove the hazards of the past. The modern Antarctic explorer is faced with bringing heavy tractors across hidden crevasses which Scott's parties on foot or with dog-teams would have passed without even being conscious of their presence. Every time an aircraft flies over such a country, where ground aids are few, the crew are at risk - although they are travelling in complete comfort. Radio is now relied upon to monitor progress in the field and to call up supplies or assistance when necessary. But radio too is fallible and, in remote regions, planning must ensure correct actions if communications break down.

When these aids to modern travel fail, a party may again be exposed to the difficulties of climate and terrain which faced their early predecessors. It is therefore necessary, even today, that men who take part in exploration should have the temperament, knowledge and experience to be able to help themselves when unexpected events occur. It follows that expedition members, both scientists and support staff, should be selected for their mental stability as well as professional competence in their tasks. They must have a balanced outlook which does not allow too lively an imagination to take charge, for this can lead into realms of the impractical. The explorer's way of life is essentially practical, and exotic or extreme ideas are undesirable unless accompanied by the exercise of sound judgment. In the wilder parts of the world there is little room for experiment or error. Judgment which involves a degree of caution and a definite appreciation of consequences is of paramount importance.

In dealing with nature and the infinitely variable circumstances which she can suddenly present, an almost instinctive assessment of the problems may be necessary. "Instinct" is perhaps a dangerous word, for it is as difficult to define as the state of being

On the other hand, people working "accident prone". In this context it implies being "in tune with nature" that is being able subconsciously to in uninhabited regions have the problem of remaining on good terms with their few companions. This is not always easy for life becomes extremely parochial, and small matters are liable to assume disproportionate importance. Here again any degree of pretence is valueless, for companions will immediately recognize it - and nature herself takes no account of the unreal.

We have looked at some of the practical and human factors which affect the traveller in the field. Equipment and materials will continue to advance both in efficiency and complexity. As each new modification is made, explorers will judge its value for their purposes and adapt themselves to new techniques. Each generation will produce successors to those who have gone before. The basic human qualities remain the same. Only man's environment changes, and each generation adapts itself to the rapidly increasing facilities and capabilities provided by its predecessors. The nature of exploration is itself changing, both in its meaning and its scope for advancing knowledge demands more and more detail - and this provides a limitless future.

This consideration may be extended to a person's general personality, because for anyone intending to travel in environment changes, and each generation adapts itself to the rapidly increasing facilities and capabilities provided by its predecessors. The nature of exploration is itself changing, both in its meaning and its scope for advancing knowledge demands more and more detail - and this provides a limitless future.

The author is president of the Royal Geographical Society

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The association for verbal arts presents its manifesto, arguing that verbal skills are neglected by the education system

Talking in class

Urgent reforms are needed in the teaching of English, particularly in secondary schools and higher further education. For most people, training in the verbal arts is a missing subject.

Other arts, such as music, painting, sculpture or drama, include practice as an essential component. In contrast, courses in literature usually concentrate on the understanding, description and evaluation of texts, with some attention to critical method. Courses in language are mainly concerned to introduce students to the analysis of speech acts and to linguistic theory. Most literature and language courses do not require students to develop their skills in non-discursive modes of prose or in verse. This is an extraordinary situation.

It is an unfortunate anomaly that verbal arts as part of the discipline of classics were not carried over into the study of English when this became a major academic area in the early years of the century. It is time to return to a more effective and longer established tradition. English, at all levels, should involve the study and practice of a wide range of modes, written and oral, literary and non-literary.

Too often, writing by children after they leave primary school is unimaginative and unadventurous. What most secondary school teachers are expected to ask from children is "fair copy" work. There are notable exceptions. Some teachers have achieved great success in developing imaginative writing, but they are in a minority. What is shown at O level is reaped at A level and beyond. Students of English at polytechnics and universities often write dull, secondhand discursive prose and are taught to do nothing else. This is particularly unfortunate because many of these students privately attempt to develop creative

abilities in language, and all must be counted among the most verbally gifted of their generation. English, as at present constituted, neither meets their needs nor, arguably, fulfils its duty to the community, to which verbal skills are so vitally necessary.

Many teachers in Britain regard verbal arts under the guise of "creative writing" with suspicion because often there has been too much emphasis on free expression. True creativity in any art can best be developed within the framework of a thorough understanding of the nature and history of art. The notion that verbal creativity is somehow more self-indulgent, undisciplined or less than other forms of creative activity. Responsible teaching is that which develops purposeful artistry in the handling of the medium. Verbal skill must be taught and practised in the curriculum, not left to chance. For it is one of the most important requirements for membership of modern community. Precise and creative use of language is of major importance for the maintenance of our complex intellectual, industrial and democratic structures. Practice in verbal arts develops emotional and intellectual discrimination and provides the individual (and through the individual, society) with a vital tool of discovery and communication.

In recent years many English teachers have grown uneasy at the split between academic and professional writers. No discipline concerned with an art should divide those who study from those who practice it. The number of writers

fellowships, residences and part-time posts should be increased, on a par with the situation that obtains in other arts, while the role of academics in the encouragement of verbal skill and creativity should be greatly expanded.

Practice in the verbal arts is valuable not only for its own sake, but because it helps students appreciate the achievement of writers of the past and take an informed interest in contemporary writing. It provides an intimate and practical insight into how language works, so acting as a bridge between literary and linguistic concerns. Modern literary theory, too, is most easily understood by students who have made their own raids on the inarticulate.

No doubt intending writers may benefit from an expansion of English to include verbal arts.

Peter Abbs
Marie Altnorth
Susan Bennett
Malcolm Bradbury
John Bradbent
John Brown
Christopher Butler

Anne Clive
Diane Colclough
Richard Cooper
C. Brian Cox
John Cox
David Craig
Douglas Dunn

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Sir Roy Shaw
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Anne Sless
Raymond Williams
Clive Wainman
Alan Young

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of

BOOKS

Scientific adventure story

The Cambridge Illustrated History of the World's Science by Colin A. Rugan
Newnes Books and Cambridge University Press, £12.95
ISBN 0 600 38423 3

In chronicling science's "unprecedented voyage of conquest" from Neolithic times up to the present, Colin Rugan has managed what few academic historians would ever attempt: he takes in the spectrum of the natural sciences, including mathematics, and unlike many previous books gives generous coverage – indeed, praise – to the non-western traditions (his conspectus of Chinese science, derived from Needham, is a model of distillation).

Writing in a concise prose, Rugan (an experienced science popularizer) explains technicalities with clarity and concreteness (copious diagrams help). The standard of accuracy is high, and the coverage reasonably balanced, even if the present century is curiously short-changed, the social sciences are omitted, and Rugan's sureness of touch occasionally deserts him in dealing with the life sciences (for example, Freud is oddly said to "complement" Pavlov, and the two surgeons, William and John Hunter, get hopelessly confused). In short, this is the volume one would now give to anyone wanting the march of science encapsulated between two covers.

But there's the rub. For Rugan sees science as a curiously disembodied force, marching on. A collective intellectual endeavour, it is the "glorious venture of the human intellect". His book thus comprises a sequence of end-on biographies of scientists, each making his "contribution" towards solving the "puzzle of nature", having enjoyed the "thrill of discovery", they bow out, passing on the "torch" which carries the "flame of science" onwards through time. Rugan's metaphors thus picture science as a cumulative progression, replete with beginnings, foundations, vital steps, holds, and so forth, culminating in the "modern scientific approach".

Now, one of the main thrusts of the academic history of science during the past 30 years has been to warn of the blindspots of this kind of triumphalist hagiography of science, pointing out the dangers of anachronistic "Whig" readings of the advancement of science based on hindsight. Yet none of this has rubbed off on Rugan's text (or indeed his bibliography, which comprises only biographies). True, he offers a few passing discussions of such as Hermeticism, although these are mainly disparaging and dated (by now the research front is questioning Hermeticism's real influence).

Almost like a Victorian positivist, Rugan can still view religion and metaphysics as baleful, alien, retarding forces. Indeed, he can still write of "the great battle between science and religion" – showing a cavalier disregard for the intellectual roots and affinities of natural inquiry in different epochs. We thus meet Newton (the astronomer, but not Newton, the alchemist, for Rugan rigidly demarcates his multifarious preoccupations into the scientific and non-scientific. In moving to London, we are told, Newton had "forsaken science", so that in the "spare time" of his "retirement" he could pursue "religious speculation" – as if the natural and the divine had not been inextricably intertwined throughout his career.

Revealingly, Rugan packages up the scientific revolution into a series of breakthroughs, in particular spheres: optics, astronomy, kinetics, and so on, with little mention of the corpus of natural philosophy that formed its matrix and shaped its problems (matter theory hardly figures in this book at all). And all is judged, praised and blamed with an eye to the scientific present (Relativistic physics was "disappointing", whereas the influence of "catastrophic" events was "unprecedented voyage of conquest").

Thoughtful people have been perturbed of late about science's contribution to conquest, its ripe of nature, its role in domination and destruction. At first glance, Rugan seems to grasp this nettle on his opening page, juxtaposing the inauguration of the Mount Hamilton telescope in 1917 against the contemporary carnage of the First World War. But not so, Rugan's point is not to wrestle with the grim paradox that science is perhaps at once the light of the world yet also the exterminating angel. Rather, what the cameo symbolizes for him is science's noble capacity to transcend, indeed to dwarf, the sordid tragedy of power politics and slaughter.

Rugan makes short work of doubters: "Fear of science is based on ignorance". Taken thus, the book perpetuates a mystifying idealization of science. Rugan has nothing to say of science's involvement – through applied science, technology, politics, power, ideology – with human lives and destiny. In his discussion of nuclear physics, there is not a single mention of the atomic bomb? And this artificial elevation of science above society is achieved by authorial fiat: Rugan simply declares at the outset that he will focus solely on pure science.

This is an able book. But the portrayal of science as intellectual adventure is *Boy's Own Paper* stuff. Surely it is a fundamental failure of imagination to present science as an adventure, with no more responsibility for human welfare than a pack of intellectual puzzles.

Roy Porter

Roy Porter is a lecturer at the Wellcome Institute for the History of Medicine, London.

Wrapped on the knuckles

Betrayers of the Truth: fraud and deceit in the halls of science by William Broad and Nicholas Wade
Century, £8.95
ISBN 0 7126 0243 7

In this popular book, the authors (both science journalists) present a series of examples of self-aggrandizement and arrogance in science which have led to data-fudging, fabrication, plagiarism, and misappropriation of credit and priority, together with the failures of the scientific community to police such frauds. Those general readers who believe that scientists, by their calling, are modest, honest people will learn a lot.

We all need to be frequently reminded of what is nicely presented here as the moral of the Alsabti plagiarism case – namely that most published science is worthless. However, as for the book's grand aim – exposing the ideology and revealing the true nature of science through the examination of fraudulent episodes – the book is itself a bit of a fraud.

For about two years, Elias Alsabti worked in the United States as a researcher into aspects of cancer. As colleagues became suspicious of his activities, he moved (with forged credentials) from one medical institution to another, and during that time he published about 60 papers, all or most of which were plagiarized. Broad and Wade explain that Alsabti was able to build up this remarkable *curriculum vitae* because he operated on the fringes of science, doing relatively unimportant work, and publishing in obscure journals. Because of this, it was unlikely that the authors of the original papers would see the plagiarized versions. Clearly, too, the referees of Alsabti's contributions were unaware of the originals. It is this, rather than the size of the fraud problem – a subject which can be debated all day precisely because in itself it does not make a lot of difference – which gives cause for alarm.

Although we know that most research papers are never cited, and probably never cover the critical case, brings home this dry fact in a quite startling way. That the published penumbra which surrounds the productive core of science is big enough to hide an Alsabti is remarkable. Perhaps there are too few scientists doing really creative work because there are ample and more certain career opportunities

for the time-server in the shadows. The penumbra is supported by the increasing bureaucratization of the measures of scientific worth – research money, first-class journal, and number of publications – and, as Broad and Wade point out, it is sustained by the explosion of the subsidized scientific literature.

Alsabti is the subject of chapter two, and other chapters cover Burt, Kammerer, Gullis, Summerlin, Lysenko, Levy, the Hewish/Jocelyn Bell affair, Newton, Millikan, Pildown, and so forth. However, this desire to be comprehensive has presented problems. Although the authors at times seem to want to say something serious about the establishment of scientific truth, priority disputes and plagiarism are not the same problem as IQ tests and Lamarckianism as far as epistemological conclusions are concerned. Indeed, it is difficult to work out what the wider conclusions are.

The major claim is that the ideology of science, which the authors say is supported by philosophers, historians and sociologists, is wrong. This ideology holds that scientists are objective, egalitarian and open, because their system of norms is supported by the ready repeatability of scientific work. But the authors present examples to show how mechanisms such as peer review of grants, the refereeing system and replication do not safeguard against fraud and data massage. This is presented, in the main, as their own view, opposed to the naivety of the academics. However, their sketch of "the ideology" is a caricature of the traditional view, even though it is the caricature of science held by most laypersons and many scientists. The larger part of the authors' opposed view is a bowdlerized and unacknowledged version of more recent currents in history, philosophy and especially sociology of science.

Important scientific disputes are not so clear cut as they are made out to be in *Betrayers of the Truth*. The complexity of work at the frontiers of science makes disagreement endemic where work is important enough to give rise to competition. Although we glimpse this in the case of Summerlin and Kammerer, the relevant conclusions are not drawn. Broad and Wade's simplistic, black and white, picture of scientific dispute may be valid in cases of crude plagiarism and fabrication *de novo* but, when extended, it reinforces the existing ideology. In their hands the problem turns out not to be a philosophical puzzle about the nature of the scientific game, but a matter of more discipline for the players.

We can agree then with the authors' minor conclusions: outright fraud would occur less if the scientific community was collectively less naughtily and more concerned with keeping its house in order. But the epistemologically interesting cases are those at the frontiers of science where no one is sure what is going on. This is a feature of man's relationship to nature, not the breadth and depth of science's shadow lands.

H. M. Collins

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Plant reactions

Plants and Microclimate: a quantitative approach to environmental plant physiology by Hamlyn G. Jones
Cambridge University Press, £27.50 and £12.50
ISBN 0 521 24849 3 and 27016 2
Plant-Atmosphere Relationships by John Grace
Chapman & Hall, £22.95
ISBN 0 412 23180 8

When one considers the complexity of the questions being asked by contemporary physics, it is perhaps hardly surprising that many practitioners of that most noble of sciences should have taken to exploring the still largely uncharted world of living organisms. For this, biologists should be grateful, not least because the physical approach to biology emphasizes the total interdependence of the organism and its environment. Too many biologists, particularly in this molecular age, seem to view the organism – or, even the cell – as a self-contained, and self-sufficient, entity.



Robert Hooke's view of a nettle seen through a microscope, together with a plot of wind out and a drawing of his hygrograph. A seventeenth-century drawing of the *Micrographia*, reproduced in *The Cambridge Illustrated History of the World's Science* by Colin Rugan.

ignoring the obvious truths that each organism is formed from, continually influenced by, and eventually succumbs to, its environment.

On the other hand, one sometimes suspects that on the physicist's map of the biosphere, those territories on the biological side of the organism/environment interface are labelled: "Here there be monsters and demons!" The authors of these two books have bravely challenged these mythical beasts and the result, in both cases but in different ways, are sharp, critical and satisfying treatments which are almost successful in balancing the physical and the biological approaches.

The higher plant, of course, is most particularly dependent upon its immediate environment. Being rooted to the substratum, it cannot escape environmental exigencies and therefore must be adaptable to survive. Both books deal with plant/environment relationships and cover essentially the same ground, although obviously that by Dr Jones, being almost four times the larger, is both wider and deeper in its treatment. Dr Grace, writing for undergraduates who will probably not specialize in the environmental physiology of plants, has produced a slightly racy account, presenting data and concepts in an easily assimilable manner, but not having the space to give the underlying experimental evidence more than cursory and rather random attention. His book is one of a series called *Outline Studies in Ecology*. The larger book, on the other hand, is written as a major text for advanced undergraduates specializing in plant physiology, with room for more examples and evidence and, indeed, for more questions and speculation.

The principal difference between the two books, apart from features associated with size, is the inclusion of the below-ground environment in Dr Jones's coverage, whereas Dr Grace restricts himself to the aerial environment. Thus, both books cover radiation, heat and mass transfer, energy balance, gas exchange, including the detailed treatments of photosynthesis and stomatal behaviour, and the behaviour of plants as vegetation stands. The larger book also deals extensively with plantwater relationships and has a short but useful chapter on yield improvement. A welcome feature of both books is the wealth of appendices covering physical constants, units, conversion factors, useful formulae and other assorted quantitative information, although I was concerned to see how many symbols were used by the two authors for entirely different purposes. A translation from the

elementary to the advanced text would therefore be quite difficult.

As might be expected, both books are uncompromisingly quantitative and I congratulate the authors on their clear and progressive treatment of equations, which should help to defuse the blank terror commonly experienced by the typical, non-numerical, biology student upon the first encounter with a mathematical formula. The authors become much less sure-footed when dealing with those topics, particularly biological, which have not yet become open to quantitative treatment. On physical matters, the treatment is authoritative, and the larger book, in particular, effectively demonstrates the power of mathematical modelling in certain aspects of plant physiology. In the more biological parts, however, the reliance of both authors on culling information from reviews and textbooks is clearly evident.

Although both books try, at different levels, to balance the physical and biological aspects of their subject, and each does an excellent job within its own remit, I must admit to a slight feeling of expectations unfulfilled. Plants both react to their environment – in "immediate mode", as it were – and respond to their environment – in "deferred mode". Clearly, in the former sense, they behave in accordance with physical laws exactly as would a mechanical model. When plants respond to environmental factors, they do so by sensing environmental fluctuations, interpreting the information thus gained, and selecting appropriate changes in their metabolic and developmental patterns as determined by controls exerted upon gene expression.

Such responses to the environment are part of what differentiates animals from inanimate matter, and only when such adaptive and acclimatory responses can be placed on a quantitative basis, will it be possible to achieve a wholly satisfactory balance between the physics and the biology of plants and their environments. In the meantime these two books – the best attempts I have yet seen – deserve to be widely used, both by biologists and physicists.

Harry Smith

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Books III and IV of Aristotle's *Physics* have been translated and published with notes by Edward Hussey by Oxford University Press at £13.50 and £8.50.

BOOKS

UNIVERSITY PRESSES

The way he lived

The Letters of Anthony Trollope
Volume one, 1835-1870
Volume two, 1871-1882
edited by M. John Hall
Stanford University Press, \$87.50 (the set)
ISBN 08047 1076 7

The penny post and the regularity of postal services – the pillarbox in my modern suburban street was emptied twice a day in the 1880s – encouraged the Victorians to be industrious letter writers, and in recent decades, with the intensification of Victorian studies, one after another of these eminent correspondents has been edited to modern scholarly standards.

Gordon Ray's Thackeray in the 1840s and Gordon Haight's George Eliot in the 1850s led the way; Mill, Newman, Gaskell, Macaulay editions followed, the magnificent stately procession of the Pilgrim edition of Dickens's letters and of the Duke-Edinburgh edition of Carlyle's has begun and will continue for years to come, and lately Oxford University Press (which has published most of these series) has produced the opening volumes of the letters of Hardy and Tennyson. Now Stanford University Press presents, very handsomely and completely in two volumes, Anthony Trollope.

Collected here in an edition as complete as possible at the present time, their editor states, they "chronicle the everyday life of Victorian England's busiest man of letters". The one-volume *Letters* (OUP, 1951), edited by the pioneer Trollope scholar Bradford A. Booth, is entirely superseded. M. John Hall prints twice as many letters as Booth, offers full instead of sometimes summary texts, and annotates them much more fully. The text is also embellished by 36 illustrations.

"Victorian England's busiest man of letters" Who could have been busier than Dickens? Certainly for much of his writing life, Trollope held a responsible full-time job (as few major authors have done), though "the Post Office" must be understood in the context of Victorian practice. As Trollope told G. H. Lewes, whose son was seeking a job in the Post Office, "a decent situation" in the Civil Service "leaves ample time for other work".

Known as an appointment in the C Service always presuming the man to be one who must live by the sweat of his brow. He confessed to being "a slave to hunting", very unwilling to give up his Wednesday hunt (he was, five years before he retired from the Post Office). He had particularly relished the position he had held as a young man, which got him out and about; he wrote, "A Surveyor's clerkship is by far the nearest appointment which a man can have in the post office service; and I know none so desirable in any other branch of the Civil Service". Henry James, in his delightful tribute, was to characterize him as "a novelist who hunted the deer". In contrast to "the sedentary school" of novelists, it is equally just and suggestive to recall that he held posts, increasingly sedentary in kind, in a large-scale organization; this gave him a valuable sense of how the world really worked.

Not the least interesting of these letters are those about his job, including official reports still on file in the General Post Office. "I made no mistake about the pace of the camels," he replies when his report from Alexandria was queried. The GPO was notoriously nobbled by untrustworthy Egyptians: "I must observe that about Bey's objection... I should never give way in anything to an Oriental". In such remarks, one is reminded of the editor's comment that, while "the style of Trollope's letters will add little to his literary reputation", they do, indirectly but importantly, reveal the kind of person Trollope was: honest, frank, blunt, earnest, gallant, playful, quick to take



Trollope by Spy

offence and quick to be reconciled, kind, generous, intelligent, self-deprecating but with a strong belief in his own ability and worth.

Often the letters remind one too of the remark by John Blackwood, the publisher out of all his many publishers to whom Trollope was closest, that "he is about the most shrewd & practical man of letters going". (The obverse of this appears in a diatribe by Carlyle, quoted in a footnote: "A distasteful little pug, that Trollope; irredeemably imbedded in commonplace, and grown fat upon it, and prosperous to an unwholesome degree.") The busiest, the shrewdest? Two superlatives Trollope claimed for himself: "I have perhaps had more dealings with publishers than any man living" – and these *Letters* will be of value to the increasing number of students of Victorian publishing history, partly along the lines indicated by the chapter on Trollope in A. Sutherland's *Victorian Novelists and Publishers*.

The other superlative, again expressed with modest tentativeness, is: "I have written a good many novels, – more I believe than any man alive". Lucky he specified "man" – Mrs Oliphant ended with a tally of almost a hundred – but that letter was written nearly ten years before his death, and a year before his death he gave an updating to a biographical inquirer: "I have written about 80 novels and novelettes, have written about almost all English speaking people, have written a life of Cicero, & memoirs of Caesar & Thackeray. I have been twice round the world, and was for 35 years in the Post Office." Happily, Professor Hall quotes the *Examiner* (February 23, 1878), claiming Trollope as a symbol of what had made Britain great: "We may well doubt whether any country but our own could furnish such a marvel of productive energy".

No wonder Mrs Thackeray calls for return to Victorian values; Trollope deserves a Queen's Award for Industry. These volumes throw little light on Trollope's fiction, apart from his dealings with publishers and magazine editors. Thus, the letters written during 1873, when *The Way We Live Now* was being composed, include one about the title and one about the illustrations, but nothing else: nor do they contain any remarks upon public or commercial affairs, or the ethos of the day, which remind one of the novel's preoccupations and its narrator's attitudes. (By contrast, Dickens's letters while he was writing *Little Dorrit*, a comparable novel, often suggest the state of mind which informs that fiction.) Trollope's general silence about such matters was partly a matter of modesty. After telling one correspondent that he forgets every professional discipline, it was inimitable to a view of the whole. Toulmin believes that current trends are bringing about the death of such speculator theories. In quantum theory, in human sciences such as depth psychology, and in the growing concern with ecology, the reintegration of humanity with nature which leaves "room for scientists, philosophers and theologians to sit down together and to reexamine in detail the scientific, ethical and ideological issues that arise from such ideas as 'natural status' and 'the larger scheme of things' (cosmos)".

Although this is an interesting synthesis of which I am particularly sym-

pathetic, I think the case needs more argument than it is given here. There are other tendencies in contemporary science, such as the successes of molecular biology, which seem to work in the opposite direction. I regret that Toulmin did not choose to expand the lecture material on which this essay is based so that it formed the body of his book. The theme is one which justifies, indeed demands, an extended treatment. Instead the volume is made up to acceptable length by reprinting earlier articles, running back to the fifties – the easy way out.

The first of these reprints is a well-known warning, uttered over 25 years ago, about the danger of "scientific myth-making", the blowing up of science into grand schemes by scientists who pose as "initiates", rather than acknowledging that outside their own subjects they are ordinary men. This is a warning that modern theorists will also have to take into account. On the one hand, it is clear that there is no unique extrapolation from science to wider significance, as people like Julian Huxley sometimes pretended. On the other hand, our knowledge of the physical world is not so accommodating that any meta-physical structure can be erected on it. It would be foolish to deny that the scientific discoveries of the past 150 years have had a significant effect upon the theologians' understanding of the possible meanings of a doctrine of creation.

Sandwiched between the first and last essays are over 100 pages of Toulmin's reviews of books written by people who qualify as cosmologists in his sense. The writing is interesting and at times witty. There are certain recurrent themes, such as French resistance to Darwinism or the need to give at least as much attention to the effects of culture and history as to the study of structure. François Jacob is reprimanded for neglecting the importance for evolution of population studies and concentration solely on the mechanism of DNA. Arthur Koestler appears no less than three times, as his books arrive at Toulmin's desk for review. Recycling is an economical device but this central section of resurrected reviews is of marginal value to the main theme of the book.

Durham and Purrington take a more conventionally limited view of the meaning of cosmology. Their book is restricted to an historical account of the development of ideas about the total structure of the physical world. They state that "we will for the most part be descriptive rather than analytical", which is not a recipe for excitement. In fact more than half their book is poised intellectual history, with the limitations of that genre.

There are problems of balance: five pages on the details of ancient Babylonian and Egyptian calendars; scarcely more than five lines on Augustine, whose profound ideas on time receive no mention at all. There is also a tendency to point in black and white. Much as we must regret the attitude taken to Galileo by the church authorities, it is a more complicated story than is here conveyed.

Eventually we reach Einstein and the authors' task changes to one of expounding modern views of the nature and evolution of the universe. This is not particularly well done and there are surprising lurches of level. We are told what a field is, but expected to know the nature of a plasma. The material is not well ordered and there are too many parenthetical exhortations to "see below". At times there is too much detail (for example, about cosmological models); on other occasions reference is made to topics which will not be intelligible to the general reader without much more exposition (for example, grand unified theories). There are some mistakes, the worst of which is a muddle of errors in the figures (12.1) which purport to explain the problems of synchronization and simultaneity in special relativity.

Yet Durham and Purrington do refer to important developments in our understanding of the world, and the big bang theory and (inadequately) the principle, which have taken place during the period covered by Toulmin's reprinted writings. These insights seem to have made no impression on the philosopher, although it is hard to think that they are totally irrelevant to his theme.

John Polkinghorne

John Polkinghorne, formerly professor of mathematical physics at the University of Cambridge, is now a writer.

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BOOKS

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Changing values

Revisions, volume three: *Changing Perspectives in Moral Philosophy* edited by Alasdair MacIntyre and Stanley Hauerwas
University of Notre Dame Press, \$19.95 and \$9.95
ISBN 0 268 016143 and 01617 8

A philosopher and a theologian, Alasdair MacIntyre and Stanley Hauerwas have assembled here a rather mixed bag of essays, whose chief point of contact, insofar as there is one, is an opposition to certain developments in moral philosophy during the first half of this century.

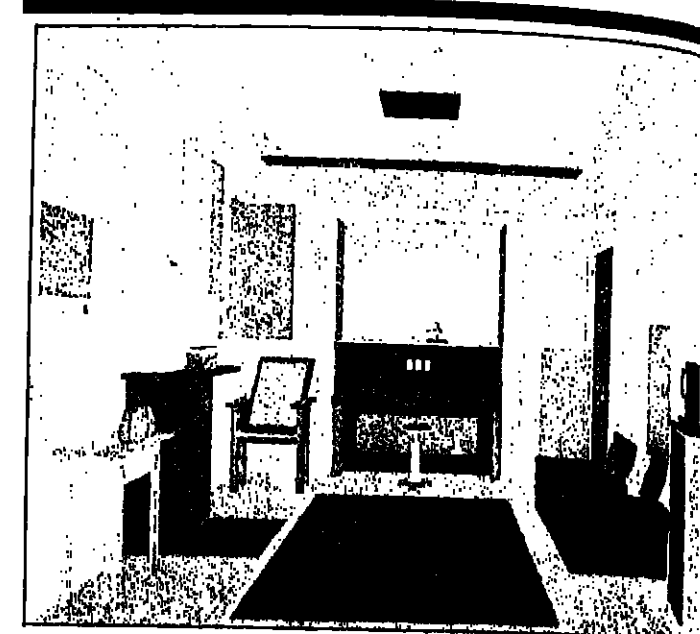
Though he is rarely mentioned by name, most of these developments are associated in particular with the prescriptive account of R. M. Hare according to which our moral judgments are a function of our choices. Hare would of course admit that in any normal sense our moral views are not usually explicitly chosen but assimilated from parents, teachers and others with whom we have contact. But theoretically, so the argument goes, it would be possible for each of us simply to decide to evaluate things differently.

Moreover, since any set of moral values could be the result of such a choice, we may represent someone's moral allegiances as the result of their having chosen to value certain things, honesty, self-sacrifice, kindness, rather than others. But since, in principle at least, there is no absurdity in their having chosen to value mendacity, greed and viciousness, there always exists a gap between the claim that such and such is a case of honesty or mendacity, kindness or viciousness, and the judgment that such and such is right or wrong. This gap between facts and values is bridged by the agent's decisions.

MacIntyre's own view of this position (a view developed in the essay which opens this collection as well as in his recent book *After Virtue*) is that, far from being, as intended, an account of morality *tout court*, in fact it merely mirrors one aspect of morality, or to be precise one particular sort of moral context. The context in question is that of a civilization, postwar Europe and the United States, in which both the moral traditions which in the past determined people's values for them and the religious background which gave sense to many others, have broken down. Lacking the guidance of tradition and religion, members of such societies will be forced to choose which values to adopt. And according to MacIntyre this is the choice of which the prescriptivist speaks.

I do not think that it would be unfair to say that MacIntyre's essay sets the context for the remainder of the book. Certainly there is, as the editors insist, disagreement in approach among their contributors. Some, for example, Iris Murdoch, Edmund Pincoffs, J. B. Schneewind and Annette Baier, can be seen as offering proposals for remedying the lack of traditional values in western society (sometimes, as in the case of Hauerwas and Murdoch, by an attempt to reintroduce religious considerations, sometimes as in the case of Annette Baier by an appeal to explicit ethical values). Others, for example, Peter Singer in his essay on the concept of 'humanity', are content to identify the breakdown, in tradition and to sketch its consequences. Nevertheless, what is common to most of them is an acceptance of the thesis that theories such as Hare's do reflect a breakdown in moral traditions.

This is, of course, primarily a historical rather than a philosophical claim, and it is for the most part one for which remarkably little evidence is adduced. Thus, for example, Baier's claim that the value of personal honour, and along with it the concept of a personal insult, have now become 'mere anachronisms (a claim which seems on the face of it obviously false) is given only the sketchiest support in history. Again, the even more implausible claim, originally due to Miss Anscombe, that such moral terms as 'ought', 'should', 'obliged' have



"Design for Spatial Colour Composition in Grey", a 1924 work by Vilmos Huszar which comes from *The De Stijl Environment*. The book by Nancy J. Troy and published by the MIT Press at £35, is about the artists and architects whose focus was the Dutch magazine *De Stijl* from 1917 to 1931.

sense only in a now largely defunct religious context, is treated by several of the contributors as a conclusion which the reader can safely be expected to reach on his or her own initiative without benefit of evidence.

True, such criticisms cannot be levelled against what are perhaps the most interesting contributions to this collection. Simone Weil's discussion of the *Good* and Quentin Bell's "Bad Art". Unfortunately neither seems to have much in common with the other essays, particularly the latter which seems quite grotesquely out of place here. MacIntyre's own claim that, like the other papers, it serves as a useful corrective to recent tendencies in moral philosophy, while no doubt not without an element of truth, scarcely justifies the inclusion of a straightforward essay on aesthetics in a collection devoted to recent developments in ethics.

Richard Beardsmore

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Poetry in myth

Myth in Africa: a study of its aesthetic and cultural relevance
by Isidore Okpewho
Cambridge University Press, £20.00
ISBN 0 521 24554 0

Debate about the relevance of cultural values to social purposes, and of the right balance between indigenous and exogenous ones, is of great insistence throughout black Africa.

Dr Okpewho teaches English in Nigeria at the University of Ibadan, which has provided a principal arena for the debate, and here his chief critical adversary is the poet, dramatist and publicist Wole Soyinka, formerly at Ibadan, now at Ife University. Dr Okpewho's approach rests on a very wide reading of what outsiders, social scientists and historians as well as theorists of literature, have said about African myths and about myth in general.

A rather breathless critical survey of theories of myth, ranging from Max Müller to Freud, Cassirer and Malinowski to Lévi-Strauss and G. S. Kirk, occupies the first chapter, where it becomes plain that Okpewho, as a literary scholar and novelist, is primarily interested in myths presented as oral narratives. Chapter two engages with several attempts to reduce myth to a particular essence: through a linkage of myths with related rituals, or through a typological contrast with history and fiction, or through their alleged dual symbolic structure.

This is done with vigour and conviction, but I wonder if Okpewho's emphasis on the poetic and imaginative qualities of myth, does not run the risk of a certain vagueness - for it comes close to identifying myth with creative literature in general. None the less, it is a valuable corrective to that reduction-

BOOKS

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Trades description

The Shopkeeper's World 1830-1914
by Michael J. Winstanley
Manchester University Press, £19.50
ISBN 0 7190 0728 3

The Penny Capitalist: a study of nineteenth century working-class entrepreneurs
by John Benson
Gill & Macmillan, £15.00
ISBN 0 7171 1084 2

Successful shopkeeping - indeed, effective capitalistic enterprise of many kinds - has always depended to a considerable extent upon the ability to package, present, and price the article in order to effect a sale.

Judged by these criteria Michael Winstanley's book satisfactorily meets the first two requirements, but potential purchasers should be aware that while the first half of the book is analytical the second rests heavily upon a series of interviews conducted by the author with aging tradesmen, among whom is a grocer, a greengrocer, a butcher, a saddler, a pawnbroker and several village shopkeepers. Interesting and informative though these testimonies of personal experiences are, despite the uncertain reliability of memories extending backwards beyond 1914, the questions these transcripts raise - of the role of families in shopkeeping, the effect on children's education and career, and the reason for the resilience of the small shopkeeper - are alluded to, but are not pursued.

The reason for this lack of integration of literary with oral evidence is partly explicable by the limitations of the latter, which can only refer to the Edwardian shopping world whereas the study encompasses Victorian retailing, too. Even in part two, which deals with "the fight for survival", and explores the forms of retailing competition from 1890, however, references to oral evidence are infrequent.

Winstanley's shopkeepers speak, but they evoke and excite rather than explain, and the commentary hardly connects this evidence with the book's major themes. In contrast to the descriptive and nostalgic flavour of part three "Edwardian shopkeepers at work", is the valuable critical discussion of the economics of Victorian shopkeeping and the politics of shopkeepers. His verdict on the debate over the retailing revolution is to reaffirm Jeffrey's conclusions, published more than thirty years ago, that the transformation of the distributive trades towards large scale and multiple units was far from complete by 1914. Among the most valuable contributions of this study, however, is the measured destruction of the shopkeeper or stereotype, so often portrayed as wedged inevitably to an unqualified laissez-faire, and an emphasis upon the diversity to be found among the shopkeepers of Victorian and Edwardian England.

John Benson concerns himself with an even more differentiated population of small businessmen, each of whom was a "penny capitalist" - defined here as "a man or woman who entered business on a small scale, and for which he, or she, was solely responsible. Most enterprise of this kind was on a part-time basis, consequently the historians' neglect of working-class entrepreneurs is not entirely surprising, for the problems of finding evidence are acute." Furthermore, while business historians have been preoccupied with large and successful capitalists, labour historians have tended to concentrate attention upon those among the working classes who opposed capitalism, whether large or small, successful or otherwise.

Disputing the generalization made by other historians that urban industrial development destroyed penny capitalism, Benson describes the activities of a variety of self-employed entrepreneurs pursuing a wide range of activities, especially in the service sector. The demand for which was increasing as a result of rising living

standards and greater choice associated with industrialization and urban growth. Benson argues that whereas improved material well being generated the growing demand for services, and for other forms of output, those penny capitalists who supplied them on a part-time basis did so to prevent greater poverty rather than in the expectation of achieving substantial material improvement in their condition. Those who chose full-time activity by contrast he regards as "part of their mid-life search for independence, for freedom from the increasingly severe restraint of factory and other work discipline", which amounted to a rejection of industrial capitalism.

Both of these conclusions are consistent with the view that even by the beginning of the nineteenth century, in all except the trades offering the lowest returns, the origins of substantial capitalism were rarely to be found among the working classes. Full-time penny capitalism was not, according to Benson, a feature of a particular phase of industrialization but flourished where local conditions were favourable, in particular in towns where men were freed for full-time private enterprise by the existence of full-time

female employment, and where land-ownership was fragmented.

The concluding chapter abounds with such generalizations, which he acknowledges can be provisional only; hypotheses rather than conclusions, and they depend much less upon his survey of the various penny capitalist activity than upon the researches of Elizabeth Roberts and John Walton, whose work on a handful of Lancashire towns from the 1880s provides both quantitative dimensions (too readily applied to the national picture in this survey) and historical insight into many of the themes pursued here. Recognizing the need for generalization on a neglected topic Benson has risked a charge of having exploited and extrapolated from limited and possibly unrepresentative evidence (even of indulging in a kind of penny capitalism); but he has also succeeded in drawing attention to a fascinating element in working-class history which will surely stimulate research.

R. A. Church

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Prisoner of his age

Diderot
by Peter France
Oxford University Press, £7.95 and £1.95

ISBN 0 19 287551 5 and 287550 7
Order and Chance: the pattern of Diderot's thought
by Geoffrey Bremner
Cambridge University Press, £20.00
ISBN 0 521 25008 0

The central problem of Diderot scholarship is how to understand and evaluate a writer whose best literary work was deliberately not published during his lifetime, whose scientific and philosophical speculations, although full of stimulating and prophetic insights, rarely reached their conclusions, and whose aesthetic judgment was far too tightly tied to the ideas of his time to have universal validity. Both these books are attempts to come to grips with the problem.

Professor Peter France's slim volume is clearly intended to introduce the English reader to the complexities of Diderot and as such is highly successful. It deals quickly but adequately with biographical detail and then goes on to examine Diderot as writer and free thinker. Next the order of nature is central to Diderot's thought in all fields, is considered in some detail, followed by a rather fragmented look at the enigmatic but powerful *Nevus de Rameau*, probably Diderot's most important literary work. Finally there is a useful chapter on his aesthetic views which does not seek to hide or excuse their obvious shortcomings from a modern point of view.

Given its restricted format of just over one hundred small pages this is a useful and very readable introduction to Diderot which will undoubtedly become the pocket book of students meeting that author for the first time. In view of this it is rather a pity that, like Dr Bremner in his much more weighty and exhaustive book, Professor France chooses to pass very quickly over the vast task undertaken by Diderot in editing the *Encyclopédie* - but I shall return to that later.

Dr Bremner's book, which has its genesis in his PhD thesis, is an unashamedly dense volume of closely woven argument which will be obligatory reading for all Diderot scholars. His work is based on the conviction that there is an overall dominant pattern in Diderot's thought, arising from his perception of reality and his characteristic response to it. This is partly the result of Diderot's own original turn of mind and partly the result of conditioning by his intellectual and social environment and background. Predominant among the influences acting on Diderot, according to the author, was the idea of order, of a natural order existing in the universe, not emanating from a divine will, but existing as a property of contingent matter. This order is to be seen against a pattern of change which is partly explicable as orderly natural evolution (whether in scientific, social and political matters, or in aesthetic and literary matters), but partly apparently as the arbitrary operation of chance. This may itself be



Denis Diderot after a painting by Charles Vanloo

determined, however, by natural forces, thus in the end reinforcing the idea of natural order, but not necessarily of natural harmony.

If I have misunderstood Dr Bremner here the fault must lie, I feel, neither with his lucid exposition nor with my failure to read and understand him correctly but rather with Diderot's writings themselves which seem designed to prevent clear interpretation. His gift (or mania) for presenting all sides of an argument and for refusing to define a clear-cut body of theory or an identifiable corpus of ideas means that his impact is diffuse and flabby, unlike the razor-sharp and precisely aimed arrows of Voltaire or the armour-piercing unitary certainty of Rousseau.

The secondary thesis in this book, that Diderot was intellectually the product and even the prisoner of his age is well demonstrated with reference to a number of fields including literature, aesthetics in the broadest sense, and ethics. It is in the political and social sphere that the argument is less impressive since Dr Bremner's view of both the *ancien régime* as a political and social phenomenon and of Diderot's attitude to it seems to be based on everything he wrote except his contributions to the *Encyclopédie*. The French monarchy was after all, a bumbling, inefficient and highly centralized bureaucracy, always threatened by class and caste tensions and powerful pressure groups including the church, but not totally inhumane. It was also completely dominated by lack of effective financial management and arbitrary decision making mechanisms. Little of all this is apparent in either of these books but much of it is to be gleaned both on and between the lines in the *Encyclopédie*, to which neither of our authors gives more than a passing nod.

Heretical as this viewpoint may be ever since Goethe "discovered" Diderot the artist, it is perhaps time for us to return to the view that his greatest work was the editing of the *Encyclopédie* and that otherwise he was a notable but not a great writer or thinker, even though he may have had some eerily-like qualities.

Frank G. Healey

Frank Healey is professor of French at the University of Surrey.

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Further details and application forms are available from: The Personnel Section, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland TS1 3BA. Tel: Middlesbrough (0442) 218121, Ext. 4114.

Closing date: 30th November, 1983. (15880)

Awards

The Leverhulme Trust

RESEARCH AWARDS ADVISORY COMMITTEE INDIVIDUAL AWARDS FOR 1984

RESEARCH FELLOWSHIPS AND GRANTS

Awards of up to £5,100 to senior persons pursuing their own investigations (but not for higher degrees or equivalent).

Awards tenable for 3 months to 2 years. No subject of enquiry excluded. Applicants must have been educated in the UK or other part of the Commonwealth and be normally resident in the UK.

Application form F2C. Closing date Wednesday, 16th November 1983.

EMERITUS FELLOWSHIPS

Awards of up to £3,800 a year for 1 or 2 years to persons who have recently reached or are about to reach retirement age to enable them to complete research. Persons with an established record of research who have retired only may also be considered.

Applicants must have held academic positions in universities or other institutions of similar status in the UK.

Application form F6C. Closing date Thursday, 1st December 1983.

Applications on the appropriate form must be in the hands of the Secretary not later than the date specified and cannot be considered if arriving after that date.

Application forms and further information from The Secretary, Research Awards Advisory Committee, The Leverhulme Trust, 15-19 New Fetter Lane, London EC4A 3NR. Telephone 01-822 6952.

Overseas

NATIONAL UNIVERSITY OF SINGAPORE

PROFESSORSHIPS IN SCHOOL OF MANAGEMENT

Applications are invited for appointment to full Professorships in the School of Management from candidates who should have a PhD degree from a reputable University, preferably from a business school. Candidates should also have at least ten years of experience in teaching and research and published works of merit.

Successful candidates will be expected to provide leadership in the teaching and research programmes and the general development of the school.

The School of Management prepares students for the degree of Bachelor of Business Administration (BBA), and comprises the following functional groups:

- Finance and Economics
- Business Policy and International Business
- Marketing
- Decision Sciences
- Organisational Behaviour

In addition to teaching undergraduates, selected staff members in the school may be asked to teach postgraduate courses under the Master of Business Administration (MBA) programme.

Annual emoluments range from S\$98,530 - 130,130/134,640 - 152,690, the initial amount depending on the candidate's qualifications and experience.

Leave and medical benefits are provided. Under the University's Academic Staff Provident Fund Scheme, the staff member contributes at the present rate of 23% of his salary subject to a maximum of S\$680 pm, and the University contributes 22% of his monthly salary. The sum standing to the staff member's credit in the Fund may be withdrawn when he leaves Singapore/Malaysia permanently. Other benefits include: a settling-in allowance of S\$1,000 or S\$2,000, subsidised housing at rental ranging from S\$100 to S\$216 pm, education allowance in respect of children's education subject to a maximum of S\$12,000 pa, passage allowance for the staff member and his family, and the transportation of personal effects to and from Singapore. Staff may undertake consultation work, subject to the approval of the University, and retain fees up to 80% of their annual gross salary in any one year. (E1 = S\$3.15 approx.)

The initial contract is normally for a three-year period. For eminent candidates, a shorter term appointment of one or two years may be considered.

Candidates are invited to write to The Director, Personnel Department, National University of Singapore, Kent Ridge, Singapore 0511, giving their curriculum vitae and the names and addresses of three referees.

Application forms and further details on terms and conditions may also be obtained from Mr R. E. Sharma, Director, NUS Overseas Office, 5 Chesham Street, London SW1, United Kingdom. (15867)

RHODES UNIVERSITY GRAHAMSTOWN, SOUTH AFRICA

Applications are invited from suitably qualified candidates, irrespective of race, colour or creed, for the following posts:

- (A) Academic
- Professor and Head of the Department of Philosophy (from 1 January 1985).
 - Professor of Law in the Department of Law (from 1 May 1984).
 - Professor of Psychology in the Department of Psychology (from 1 July 1984).
 - Senior Lecturer/Lecturer for Business Data Processing in the Department of Business Administration (from 1 January 1984).
 - Senior Lecturer/Lecturer in Pharmacology in the School of Pharmaceutical Sciences (2 posts: one new post in the field of Formulation, Production and Assessment of Sterile Dosage Form from 1 July 1984. One post in Physical or Industrial Pharmacy from 1 January 1984 or as soon as possible thereafter).
 - Senior Lecturer/Lecturer in Pharmaceutical Chemistry in the School of Pharmaceutical Sciences (from 1 July 1984). (New post in the field of Pharmaceutical Analysis).
 - Senior Lecturer/Lecturer in Pharmacy Management and Economics in the School of Pharmaceutical Sciences (from 1 January 1984 or as soon as possible thereafter).
 - Lecturer/Junior Lecturer in the Department of German (from 1 January 1984).
 - Junior Lecturer in the Department of Chemistry. (Temporary post for three years from 1 July 1984. The successful applicant will be required to undertake research work leading to the PhD Degree).
 - Assistant Lecturer in Shortland and Typewriting in the Department of Business Administration (from 1 January 1984).
- (B) Non-Academic
- Systems Programmer in the Computer Centre (from 1 January 1984). (The University operates a large CDC CYBER 825 super mainframe NOS/PLATO. Experience with CDC equipment would be an advantage).
- The salary scales are:
- Professor: R23,109 x 938-24,045 x 1,035-30,255 pa
 - Senior Lecturer: R16,557 x 938-24,045 pa
 - Lecturer: R12,857 x 780-18,887 x 898-22,170 pa
 - Systems Programmer: R12,800 x 570-18,580 x 848-18,258 (Efficiency Barrier) x 848-20,835 pa
 - Junior Lecturer: R8,075 x 621-10,317 x 780-14,217 pa
 - Assistant Lecturer: R7,212 x 621-10,317 x 780-11,877 pa
- (Note: E1 = approximately R1.86)

The initial salary in each case will be determined according to qualifications and experience. Fringe benefits include generous housing allowances, financial assistance towards the University Education Children at Rhodes University and a service bonus subject to regulations. Successful applicants for permanent posts will become members of the University's pension and medical aid schemes and qualify for a housing subsidy subject to regulations.

Application forms and further particulars may be obtained from the South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE or the Director of Personnel, Rhodes University, Grahamstown, 6140, South Africa. One copy of the application should be returned to the South African Universities Office and one copy forwarded direct to the Director of Personnel by not later than 25 November 1983. (15868)



THE OPEN COLLEGE UNIVERSITY OF EAST ASIA, MACAU Head of School of Business

Applications are invited for this senior appointment in a distance teaching university college. The vacancy arises because of an internal restructuring of senior appointments with the University. The appointee will be responsible for the academic development and administration of the BBA degree programme.

Applicants should hold postgraduate university qualifications in one or more of the following areas: Accounting and Finance, Business Information Systems, Economics, Marketing, Personnel Management. Experience in Distance Education would be an advantage but is not a pre-requisite for appointment.

Applications will also be considered from candidates who can obtain a minimum of three years' leave of absence from their present posts.

It is hoped to make an appointment from Easter 1984, but an alternative date may be acceptable. The post will be normally based in Hong Kong. The emoluments and other terms and conditions of service will be commensurate with qualifications and experience. A suitable candidate will be appointed at professional level.

Application forms and further information can be obtained from the Secretary & Registrar, The Open College, University of East Asia, GPO Box 3001, Macau or from The Open College, University of East Asia, Hong Kong Office, Room 1202, Oriental Centre, 67-71 Chatham Road South, Kowloon (Tel: 3-861206). The closing date for applications is 30th November, 1983. (15869)

CLASSIFIED ADVERTISEMENTS

To advertise in the
T.H.E.S.
Please phone Jane McFarlane on 01-253 3000
The Times Higher Education Supplement
Philly House, St John's Lane, London EC1M 4BX.

Overseas continued

SINGAPORE POLYTECHNIC

The Singapore Polytechnic is a technical institution financed by the Government of Singapore and responsible for the training of technicians engineers. It has a full-time academic staff of 480 and an enrolment of 2,000 full-time and 3,800 part-time students. The medium of instruction is English.

The institution is gearing its curriculum to meet the country's industrial and technological advances. The high demand for technician manpower has resulted in a five-year expansion and upgrading programme in which existing courses will be upgraded and new ones introduced - an expansion expected to cost some S\$146 million.

If you have the expertise and experience we are seeking and can contribute to the successful implementation of our programme - now approaching its third year - we invite you to apply to join our team of professionals in one of the following positions:

PRINCIPAL LECTURERS: S\$66,100 - 81,200 p.a.

SENIOR LECTURERS: S\$55,300 - 60,800 p.a.

LECTURERS: S\$22,100 - 57,300 p.a.

(Exchange rate, September 1983, £1 = S\$3.21)

Point of entry into any of the above salary ranges will depend on qualifications and experience. Applicants for Principal Lectures should have ten (10) or more years' experience in an appropriate teaching or industrial environment, those for Senior Lecturer at least eight (8), and those for Lectureship a minimum of two (2).

QUALIFICATIONS

(A) Civil Engineering & Building Department.
A degree or professional qualification in ARCHITECTURE, BUILDING, QUANTITY SURVEYING or LAND SURVEYING. Preference will be given to those who have relevant computer application knowledge.

(B) Electronics & Communication Engineering Department.
A degree or professional qualification in Electronics Engineering with special emphasis in the fields of Communication Engineering, Digital Instrumentation and Control and Computer Engineering.

(C) Mechanical & Production Engineering Department.
A degree or professional qualification in Mechanical Engineering, Production Engineering and/or Metallurgical Engineering. Preference will be given to those with ability to teach tool and die design, machine tool manufacturing, heat-treatment and foundry technology, plant maintenance engineering, instrumentation and control, engineering design and industrial automation.

(D) Maths & Science Department.
A good BSc honours degree with knowledge in Computing.

TERMS & CONDITIONS OF SERVICE

Singaporeans and Malaysians will be offered appointment on LOCAL terms. Other successful applicants will be appointed on contracts of 2 or 3 years' duration with vacations and subsidised medical/dental benefits provided.

Under the Singapore Central Provident Fund Scheme a staff member contributes at the current rate of 23% of gross salary, subject to a maximum of S\$980/- per month, and the institution will contribute an equivalent amount towards the Fund. The sum standing to the staff member's credit in the Fund is tax-free and may be withdrawn on leaving Singapore/Malaysia permanently.

In addition to the above, a contract officer will receive free air passages for himself, his spouse and up to 3 children under 18 years of age. Baggage allowance, children's education allowance and accommodation at subsidised rentals will also be provided.

APPLICATIONS

Interested persons should write to:
Head (Personnel), Singapore Polytechnic
c/o Singapore High Commission, 5 Chesham Street
London S.W.1, UNITED KINGDOM

giving their curriculum vitae, telephone number, subjects they are able to teach and the names and addresses of two referees. The closing date for receipt of applications is three weeks from the appearance of this advertisement.

SPECIAL BOOK NUMBERS for Autumn/Winter

- 28th October SOCIOLOGY
- 4th November MATHS + PHYSICS II
- 11th November HISTORY II
- 18th November PSYCHOLOGY II
- 25th November POLITICS
- 2nd December COMPUTER SCIENCES

University of Witwatersrand Johannesburg Department of Business Administration SENIOR LECTURER/LECTURER

Applications are invited from suitably qualified persons for the above posts. The successful candidate will be responsible for the day-to-day running of the Department, including the preparation of reports and the management of the Department's budget.

The salary ranges are: Senior Lecturer: R12,857 x 780-18,887 x 898-22,170 pa; Lecturer: R8,075 x 621-10,317 x 780-14,217 pa.

Consideration will be given to any applicant who prefers to be considered for a short-term contract rather than a permanent appointment.

The salary ranges are: Senior Lecturer: R12,857 x 780-18,887 x 898-22,170 pa; Lecturer: R8,075 x 621-10,317 x 780-14,217 pa.

Benefits for full-time permanent staff include pension and medical aid fund membership, an annual bonus, 15% remuneration, 15% remuneration of tuition fees for dependent children, and a housing subsidy (subject to regulations). Intending applicants should obtain the information sheet relating to these posts from the Secretary, South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE, England, or from the Registrar, University of Witwatersrand, 1 Jan Smuts Avenue, Johannesburg 2001, South Africa, with whom applications should be lodged not later than 15 November 1983. HTS

DEPARTMENT OF GERMANIC LINGUISTICS, University of Cambridge, 4766, telephone 01-278 4411.

REMINDER

Copy for Classified Advertisements in the THES should arrive not later than 10am Monday preceding publication

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